

Power Ref: APL/REL/EMD/MoEFCC/EC/208/05/23 Date: 23.05.2023

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 Environment Clearance (EC) Compliance Status Report for 2x685 MW Raipur Thermal Power Plant at village Raikheda, Gaitara and Chicholi in Tilda Block of Raipur District, Chhattisgarh.
- **Ref:** Environment clearance vide letter no. J-13012/62/2008-IA.II (T) dated 09.05.2011 and its subsequent amendment vide letter dated 10.06.2015, 13.06.2013, 18.11.2014, 04.02.2015. EC Transfer from Raipur Energen 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, Commercial Complex, Chhattisgarh Housing Board Colony, Kabir Nagar, Raipur – 492 099, Chhattisgarh

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SIX MONTHLY COMPLIANCE REPORT OF ENVIRONMENT CLEARANCE (EC)

FOR

1370 (2x685) MW Raipur Thermal Power Plant

At

Village Raikheda, Gaitara and Chicholi, Tilda Block, Raipur District, Chhattisgarh

Submitted to:

Integrated Regional Office, Raipur Ministry of Environment, Forests & Climate Change, Central Pollution Control Board, New Delhi & Chhattisgarh Environment Conservation Board, Naya Raipur



Submitted by:

Environment Management Department

Adani Power Limited Village Raikheda, Block Tilda, District Raipur, Chhattisgarh

Period: October'2022 – March'2023

1370 MW (2x685 MW) Coal Based Thermal Power Plant

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Adani Power Limited, Raipur 1370 MW (2x685 MW) Coal Based Thermal Power Plant

INTRODUCTION

Adani Power Limited, Raipur (formerly known as Raipur Energen Limited) has set up a coal based Thermal Power Plant of capacity 2x685 MW at village Raikheda, Gaitara and Chicholi in Tilda block of Raipur District, Chhattisgarh.

Environmental Clearance has been granted by Hon'ble MoEF&CC to M/s GMR Energy Ltd. vide letter No. J-13012/62/2008-IA. II (T), dated 09/05/2011. It was subsequently amended vide letter dated 13.06.2013, 18.11.2014. 04.02.2015 and 09.12.2015.

The company has been taken over by M/s Adani Power Ltd. (APL) & name of the company has been changed from M/s GMR Chhattisgarh Energy Limited to M/s Raipur Energen Limited (REL) with effect from 20th August 2019 as 100% subsidiary of M/s Adani Power Limited. Raipur TPP has also obtained transferred EC vide letter No.J-13012/62/2008-IA.II (T), dated 05.11.2019.

Environment Clearance is transferred from Raipur Energen Limited to Adani Power Limited vide letter no. J.13012/62/2008-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 Raipur Energen Limited with Adani Power Limited. Subsequently.

Raipur Thermal Power Plant has a well-established Environmental Laboratory with equipped monitoring equipment, which used to monitor and test environmental parameters.

The company has adopted three peripheral villages and executing most of the CSR works which is supported by the Adani Foundation, in those villages in the field of their livelihood, infrastructure development, cleanliness, community health and education.

Raipur Thermal Power Plant has engaged NABL Accredited Lab for their service of sampling, monitoring and analysis of Environmental parameters as per statutory guidelines.

1370 MW (2x685 MW) Coal Based Thermal Power Plant

Compliance Status of Environmental Clearance

vide letter No. J-13012/62/2008-IA. II (T), dated: 09th May 2011 and amendment dated: 13.06.2013, 18.11.2014, 04.02.2015, 09.12.2015, 05.11.2019 & 24.04.2023. EC Transfer from Raipur Energen Ltd. to Adani Power Ltd. 24.04.2023.

SI. No.	Conditions of EC	Compliance Status
А.	Specific Conditions	
(i)	Vision document specifying prospective plan for the site shall be formulated and submitted to the Ministry within six months.	Complied. The Vision document of Adani Power Limited was already submitted to MoEF&CC, Regional Office (WCZ), Nagpur vide our office letter Ref: REL / MoEF&CC/EC/2020/ May/29, dated: 29th May 2020.
		Environment Clearance is transferred from Raipur Energen Limited to Adani Power Limited vide letter no. J.13012/62/2008-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 Raipur Energen Limited with Adani Power Limited.
(ii)	In case source of fuel supply now proposed to be run on imported coal from South Africa for running the power plant is proposed to be changed to domestic coal at a later stage, the project proponent shall apply for such a change in environmental clearance along with necessary documents as required under EIA notification, 2006 (and its amendments). In such a case the necessity for holding public hearing again or otherwise will be determined by the Ministry in consultation with the Expert Appraisal Committee (Thermal Power).	Being complied. Use of 100% domestic coal sourced from tolling linkage and open market. Talabira-1 Mine is not under operation as Mining Plan was expired and the revised mining plan is due for approval. Sulphur and Ash content of blended coal being used (procured from Market & E-Auction).
(iii)	Provision for installation of FGD shall be provided for future use.	Space provision for FGD have been provided in the plant layout. As per the guidelines of CPCB vide letter No. B- 33014/07/2017/IPC-II/TPP/15848, dated 11.12.2017. However as per MoEF&CC's Notification dated 5 th Sep 2022, Raipur TPP is falling under Category "C" Non- retiring TPPs and the timelines for compliance of SO ₂ emission is upto December 2026. Accordingly, the work is under progress for compliance as per CPCB direction.
(iv)	Stack of 275 m height shall be installed and provided with continuous online monitoring equipment's for SO _x , NO _x , PM _{2.5} & PM ₁₀ . Exit velocity of flue gases shall not be less than 22 m/sec. Mercury emissions	Complied. Stack Height is 275 meters. On-line continuous emission monitoring system (CEMS) has been installed for PM, SO2 & NOx. Monitoring of Hg in stack emission is also carried out by authorized

SI. No.	Conditions of EC	Compliance Status
	from stack may also monitored on periodic basis.	laboratory by MoEF&CC. The exit gas velocity is ensured more than 22m/sec. The latest Environment Monitoring report is enclosed herewith as Annexure - II.
(v)	High Efficiency Electrostatic Precipitators (ESPs) shall be installed followed by installation of Bag Filter and it shall be ensured that particulate emission does not exceed 50 mg/Nm ³ .	Complied. High efficiency Electrostatic Precipitators (ESP) has been provided to meet revised emission standard of <50 mg/ Nm3. The monitoring report for stack emission is enclosed in Annexure - II.
(vi)	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. Dust extraction system has been installed in coal crusher, AHP & coal bunkers. Dust suppression system through dry fog method has been installed at coal conveyor transfer points. Water spray system has also been installed in coal yards for dust suppression.
(vii)	Sulphur and ash contents in the coal to be used in the project shall not exceed 0.5 % and 34 % respectively at any given time. In case of variation of coal quality at any point of time fresh reference shall be made to MOEF for suitable amendments to environmental clearance condition wherever necessary.	Being Complied. As per the Office Memorandum, MoEFCC dated; 11.11.2020, all the Thermal Power Plants (including Captive Power Plants) having Environmental Clearance can change the Coal Source (from imported to domestic, domestic to domestic, and domestic to imported) including Lignite, directly through e-auctions/short term linkage/long term linkage/other linkage options of Ministry of Coal or any organization recognized for allotting coal linkages, without seeking the amendment in Environmental Clearance .
(viii)	Transport of coal to the plant site shall be strictly by rail. The project proponent shall therefore immediately take up the matter with the Railways. Status of implementation shall be submitted to the Regional Office of the Ministry from time to time.	Being Complied. The transportation through rail is started. Avenue plantation all along the road has already been done inside the plant premises. Compliance status of conditions mentioned in Environmental Clearance and it's time to time amendments is also kept in public domain at the website of holding company <u>https://www.adanipower.com/Downloads</u>
(ix)	Existing de-generated water bodies (if any) within 5.0 Km of the site shall be regenerated at the project proponent's expenses in consultation with the state govt.	Complied. Raipur TPP has regenerated around 6 numbers of Water bodies in nearby villages including 2 numbers of ponds are deepened and beautification has been done in consultation with state government.
(x)	The proponent shall sponsor a detailed study regarding water availability in Mahanadi River for all competing sources	Complied. Water allocation is from Mahanadi River and maintained by WRD, Chhattisgarh. Raipur TPP has

SI. No.	Conditions of EC	Compliance Status
	such as drinking, agriculture, industrial, minimum flow of water in the river during the lean season etc. through institutions like IIT, Delhi/IIT Roorkee. The draft terms of reference shall be submitted within three months which shall be finalized by the Expert Appraisal Committee. The preliminary report on the above study shall be submitted within one year.	no role in regulating the water flow downstream & distribution
(xi)	The project proponent shall undertake proactive water harvesting measures and water storage for a larger period not less than 30 days storage shall be developed. The rainwater harvesting system shall be put in place before commissioning of the plant. Central Groundwater Authority. Board shall be consulted for finalization of appropriate rainwater harvesting technology design within a period of three months from the date of this clearance and details shall be furnished. The design of rainwater harvesting shall comprise of rainwater collection from the built up and open area in the plant premises. Action plan and road map for implementation shall be submitted to the Ministry within six months.	Complied. Rainwater harvesting pond established within Plant premises of Raipur TPP and photographs of the same is enclosed as Annexure III .
(xii)	Hydrogeology in and around the project area shall be reviewed annually from an institute. organization of repute to assess impact of surface water and ground regime (especially around ash dyke). In case and deterioration is observed specific mitigation measures shall be undertaken and reports. data of water quality monitored regularly and maintained shall be submitted to the Regional Office of the Ministry.	Complied. The Hydrogeological Investigation Report for FY 2022-23 has been carried out. Copy of the report is enclosed as Annexure IV .
(xiii)	No ground water shall be extracted for use in operation of the power plant even in lean season.	Being Complied. Ground water is not used for operation of plant.
(xiv)	No water bodies (including natural drainage system) in the area shall be disturbed due to activities associated with the setting up. operation of the power plant.	Complied. No water bodies have been disturbed during construction activity & operational activity of the plant.
(xv)	Water requirement shall be optimized to around 32 MCM and shall accordingly	Complied. Water requirement is being restricted to 25 MCM. COC is being maintained more than 5.0.

SI. No.	Conditions of EC	Compliance Status
	adopt higher COC of at least not less than 5.0.	
(xvi)	Minimum required environmental flow suggested by the Competent Authority of the State Govt. shall be maintained in the Channel. Rivers (as applicable) even in lean season.	Complied. Raipur TPP has revisited and optimized water requirements by reusing and recycling approaches, the water allotment has been reduced from 37 to 25 MCM per annum by Water Resource Department, Government of Chhattisgarh.
(xvii)	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. Six nos. piezometers constructed around periphery of the ash pond for ground water monitoring. Seasonal monitoring of ground water level and quality is being done and monitoring data is being submitted to the MOEF&CC, CPCB & CECB regularly. The ground water analysis data is enclosed as Annexure II .
(xviii)	Monitoring surface water quality in the region 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. Seasonal monitoring of Surface water is being done. The monitored data is being submitted to MOEF&CC, CPCB & CECB regularly. The surface water analysis data is enclosed as Annexure II.
(xix)	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.	Complied. Excavated Soil being utilized within the project site to the extent possible.
(xx)	The project proponent shall undertake measures and ensure that no fugitive fly ash emissions take place at any point of time.	Complied. All the preventive measures have been ensured to mitigate fugitive emission from fly ash. List of Pollution Control Equipment/Devices installed to restrict fugitive as emission within prescribed limits is enclosed as Annexure V .
(xxi)	Utilization of 100% Fly Ash generated shall be made from 4th year of operation. Status of implementation shall be reported to the Regional Office of the Ministry from time to time.	Complied. Fly ash is being supplied to nearest cement industries and brick manufacturer Fly Ash generation and utilization Status is attached as Annexure VI. Being Complied.
	storage facility (silos) shall be	being complied.

SI. No.	Conditions of EC	Compliance Status
	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.	 Fly ash is being collected in dry form and unutilized fly ash is being disposed in dedicated ash storage ponds. As per MoEF&CC Office Memorandum dated 28th August 2019, utilization of fly ash in low lying areas has been permitted and the existing condition in Environmental Clearance may stand replaced, accordingly organization has started utilization of fly ash in low lying areas and land reclamation. Mercury and heavy metals are being monitored in bottom ash. No effluent is emanated from ash pond.
(xxiii)	Ash pond shall be lined with HDPE/LDPE	Complied.
	ining or any other suitable impermeable media such that no leachate takes place at any point of time. Adequate safety measures shall also be implemented to protect the ash dyke from getting breached.	Ash ponds is constructed with LDPE/HDPE & in the way that no leachate takes place any point of time.
(xxiv)	For disposal of Bottom Ash in abandoned mines (if proposed to be undertaken) shall be done after obtaining due permission from DGMS and after ensuring that the bottom and sides of the mined-out areas are adequately lined with clay before Bottom Ash is filled up. The project proponent shall inform the State Pollution Control Board well in advance before undertaking the activity.	Noted. Compliance assured.
(xxv)	Green Belt consisting of 3 tiers of plantations of native species around plant and at least 75 m width shall be raised. Tree density shall not less than 2500 per ha with survival rate not less than 80 %.	Complied. Plantation / Greenbelt development is being developed as per guidelines & in consultation with forest department for local species. Greenbelt Report is enclosed as Annexure VII.
(xxvi)	At least three 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.	Being complied. The Company undertakes various CSR activities as per framework of CSR Rules under the Companies Act. Community services in three nearby villages namely Raikheda, Chicholi & Gaitera is conducted with focus and Sontara, Gaurkheda and Murra village area also covered. The outreach is also expanded to other nearby villages namely Khamariya, Konari, Tulsi, Tarashiv, Bartori, Chatod and Samoda. The thematic area of work in villages is improving quality of education, access of health care and sanitation, empowerment and livelihood thought SHGs, individual income

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		generation & community vocational training centre and community development. CSR Progress Report with details is enclosed as Annexure VIII.
(xxvii)	The project proponent shall also adequately contribute in the development of the neighbouring villages. Special package with implementation schedule for providing potable drinking water supply in the nearby villages and schools shall be undertaken in a time bound manner.	Being complied. The Company is undertaking CSR activities within 10 km radius area with focus on project affected and Railway siding villages namely Sontara, Gaurkheda, Khamariya, Konari Murra, Tulsi, Tarashiv, Bartori, Chatod located on western and northern boundary of the proposed plant. The development work in these villages is implemented in planned and time bound manner.
(xxviii)	A time bound implementation of the CSR shall be formulated within six months and submitted to the Ministry. While identifying CSR activities it shall be ensured that need based assessment for the nearby villages within study area shall be conducted to study economic measures with action plan which can help in upliftment of poor section of society. Income generating projects consistent with the traditional skills of the people shall be undertaken. Development of fodder farm, fruit bearing orchards, vocational training etc. can form a part of such programme. Company shall provide separate budget for community development activities and income generating programme for possible self- employment and jobs shall be imparted to identify villagers free of cost.	Being complied. CSR Plan for the villages is made as per local need and CSR activities are identified by social work professionals employed exclusively for CSR through the company in consultation with communities and their representatives. Poorest of the poor families are identified basing village Panchayat's statistics and special interventions have been planned for their upliftment. Separate budget has been allocated for community development activities with income generation activities. Vocational training is being provided to youth for self-employment free of cost. We have started Pratibha Centre for local youths. To increase access of youth to educational and employment opportunities through helping them become aware of and to prepare for these. To prepare youth to become self-reliant through education and employment opportunities at Pratibha centers. CSR Progress Report with details is enclosed as Annexure VIII.
(xxix)	An amount of Rs 33.16 Crores shall be earmarked as one-time capital cost for CSR programme as committed by the project proponent. Subsequently a recurring expenditure of Rs 6.63 Crores per annum shall be earmarked as recurring expenditure for CSR activities. Details of the activities to be undertaken shall be submitted within six months along with road map for implementation.	Time bound implementation of CSR activities have been carried out & CSR budget has earmarked for CSR activities in nearby project villages. CSR Progress Report with details is enclosed as Annexure VIII.
(xxx)	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	Complied. Social Audit has been carried out by Indian Institute

SI. No.	Conditions of EC	Compliance Status
	institute of repute in the region. The project proponent shall also submit the status of implementation of the scheme from time to time	of Social Welfare and Business Management, Kolkata. The same is submitted to ministry along with previous compliance report.
	General Conditions:	h h
(i)	The treated effluents conforming to the prescribed standards only shall be re- circulated and reused within the plant. Arrangements shall be made that effluents and storm water do not get mixed.	Complied. The treated effluents conforming to the prescribed standards are being re-circulated and reused within the plant. Plant layout has been designed so that effluents and storm water do not get mixed. The analysis report is enclosed as Annexure II.
(ii)	A sewage treatment plant shall be provided (as applicable) and the treated sewage shall be used for raising greenbelt plantation.	Complied. A well-equipped Sewage Treatment Plant is installed and commissioned within premises.
(iii)	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. Drawings & other details are already submitted to the MoEFCC, Delhi as well as Regional Office of MoEFCC.
(iv)	Storage facilities for auxiliary liquid fuel such as LDO and/ HFO/LSHS shall be made in the plant area in consultation with Department of Explosives, Nagpur. Sulphur content in the liquid fuel will not exceed 0.5%. Disaster Management Plan shall be prepared to meet any eventuality in case of an accident taking place due to storage of oil.	Complied. Approval for storage facilities for auxiliary liquid fuel such as LDO/ HFO/LSHS has been obtained from Department of Explosives, Nagpur and the same has been submitted. Sulphur content in the liquid fuel well within 0.5%. Disaster Management Plan also is in place.
(v)	First Aid and sanitation arrangements shall be made for the drivers and other contract workers during construction phase.	Complied. Raipur Thermal Power Plant is fully operational. All temporary structures constructed during Project phase for facilitating contract workers are now removed.
(vi)	Noise levels emanating for turbines shall be so controlled such that the noise in the work zone shall be limited to 85 dBA from the source. For people working in the high noise area, requisite personal protective equipment like earplugs/earmuffs 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	Complied. Engineering control for noise such as acoustic enclosure, silencer have been installed in the turbine. Other than engineering controls, PPEs like earplugs, earmuffs etc. are also provided to workers in high noise area. Noise level monitoring report is enclosed as Annexure II.

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	treatment for any hearing loss including shifting to non-noisy, less noisy areas.	
(vii)	Regular monitoring of ambient air ground level concentration of SO ₂ , NOx, PM _{2.5} & PM ₁₀ and Hg shall be carried out in the impact zone and records maintained. If at any stage these levels are found to exceed the prescribed limits, necessary control measures shall be provided immediately. The location of the monitoring stations and frequency of monitoring shall be decided in consultation with SPCB. Periodic reports shall be submitted to the Regional Office of this Ministry. The data shall also be put on the website of the company.	Complied. We installed three nos. of stationary AAQMS station at periphery of the plant for Ambient air quality monitoring. Environment Monitoring Data as part of the six- monthly compliance is being submitted to MoEFCC and is also made available at company's website. https://www.adanipower.com/Downloads The ambient air quality monitoring report is enclosed as Annexure II.
(viii)	Provision shall be made for the housing of construction labor (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 completion of the project.	Complied during construction phase.
(ix)	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 Quality concerned within seven days from the date of this clearance letter, informing that the project has been accorded environmental clearance an 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 <u>http:envfor.nic.in</u>	Complied. Copies of the advertisement published in local daily Newspapers after obtaining EC and details of the same already submitted to ministry with previous compliance reports.
(x) (xi)	A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zilla Parisad, Municipal Corporation, urban local Body and the Local NGO, if any, from whom suggestions, representations. If any, receive while processing the proposal. The clearance letter shall also be put on the website of the Company by the proponent.	Complied. The environment clearance letter is available at website of Adani Power. <u>https://www.adanipower.com/Downloads</u>
	least one expert in environmental science. engineering, occupational health and social scientist, shall be created at the project site	We have well-established Environment Management Dept. headed by a competent experienced Manager with relevant academic

SI. No.	Conditions of EC	Compliance Status
	itself and shall be headed by an officer of appropriate superiority and qualification it shall be ensured that the Head the Cell shall directly report to the head of the organization and he shall be held responsible for implementation of environmental regulations and social impact improvement, mitigation measures.	qualification supported by Environmental Engineers, Chemist & Horticulturist.
(xii)	The proponent shall upload the status of compliance of the stipulated environmental clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of MOEF, the respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely SPM, RSPM (PM2.5 & PM10), SO2, NOX (ambient levels as well as stack emissions) shall display at a convenient location near the main gate of the company in the public domain.	Complied. Display board has been installed at main gate of TPP. Recent Environment compliance report will be uploaded in company website. www.adanipower.com/Downloads
(xiii)	The environment statement for each financial year ending 31 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 at the Ministry.	Complied. The Environmental Statement Report for the period FY: 2021-22 in prescribed format (Form V) has been submitted to CECB, Raipur vide Letter No, REL/ENV/CECB/22-23/202 dated 10 th September 2022.
(xiv)	The project proponent shall submit six monthly reports on the status of the implementation of the stipulated environmental safeguards to the Ministry of environment and Forests, its Regional Office, Central Pollution Control Board and State Pollution Control board. The project proponent shall upload the status of compliance of the environment of the environmental clearance conditions on their website and update the same periodically and simultaneously send the same by e-mail to the Regional Office, Ministry of Environment and Forests.	Being Complied. Six monthly compliances on the Environmental Clearance granted by MoEF is being submitted to MoEF&CC, CPCB & CECB regularly. Compliance status updated on company's website. www.adanipower.com/Downloads Compliance report for the period of April 2022 to September 2022 has been already submitted to your good office vide letter no.: APL/REL/TPP/EMD/MoEFCC/EC/218/11/22, dated: 28.11.2022.

SI. No.	Conditions of EC	Compliance Status
(xv)	Regional Office of the Ministry of Environment, forest and climate change will monitor the implementation of the stipulated conditions. A complete set of documents including environmental impact Assessment Report and Environment Management Plan along with the additional, information submitted from time to time shall be forwarded to the regional office for their use during monitoring. Project proponent will upload the compliance status in their website and update the same from time to time at least six-monthly basis Criteria pollutants levels including NOX (from stack & ambient air) shall be displayed at the main gate of the power plant.	Complied. EIA & EMP report with all necessary document & information are already submitted to RO, MoEF&CC and CECB.
(xvi)	Separate funds shall be allocated for implementation of environmental, protection measures along with item-wise break-up. These cost shall be included as part of the project cost. The funds earmarked for the environment protection measures shall not be diverted for other purposes and year-wise expenditure should be reported to the Ministry.	Complied. Separate fund has been already allocated for environmental protection
(xvii)	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 date of start of land development work a commissioning of plant.	Complied. Financial Closure granted on 10 th Dec'10. The Project development started after receiving Consent to establish dated 13 th Jun'11.
(xviii)	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 will be extended.
Condit	ions of Amended EC dated 13.06.2013	
(v)	High Efficiency Electrostatic Precipitators (ESPs) shall be installed and it shall be ensured that particulate emission does not exceed 50 mg/Nm3"	Complied. High efficiency Electrostatic Precipitators (ESP) has been installed to meet revised emission standard of <50 mg/ Nm ³ for PM. The monitoring report for stack emission is enclosed as Annexure II.
(xxxi)	The GCV of the imported coal from South Africa shall not be less than 4911 Kcal/kg	Being Complied.

SI. No.	Conditions of EC	Compliance Status
	and the ash and sulphur contents shall not exceed the limits stated under: Ash contents: 33.7% Sulphur contents: 0.7%	As per the Office Memorandum, MoEFCC dated; 11.11.2020, all the Thermal Power Plants (including Captive Power Plants) having Environmental Clearance can change the Coal Source (from imported to domestic, domestic to domestic, and domestic to imported) including Lignite, directly through e-auctions/short term linkage/long term linkage/other linkage options of Ministry of Coal or any organization recognized for allotting coal linkages, without seeking the amendment in Environmental Clearance.
(xxxii)	A long-term study of radio activity and heavy metals contents on coal to be used shall be carried out through a reputed institute. Thereafter mechanism for an in- built continuous monitoring for radio activity and heavy metals in coal and fly ash (including bottom ash) shall be put in place.	Complied Radioactivity (U ²³⁸ & Th ²³²) analysis in coal and ash is being carried out by Board of Radiation and Isotope Technology (BRIT) Government of India, copy of Radioactivity Test Certificate is enclosed as Annexure IX.
(xxxiii)	Continuous monitoring for heavy metals in and around the ash pond area shall be carried out through reputed institutes like IIT, Kanpur and records/ data maintained.	Complied. Quarterly monitoring of heavy metal and other physicochemical parameters in ground water around ash pond area is being carried out regularly by 3rd party NABL approved Environmental Laboratory. The ground water analysis report is enclosed as Annexure II.
Condit	ions of Amended EC Extension dated 18.11.2	014
(i)	The coal transportation by road shall be through mechanically covered trucks to the extent feasible, else, shall be through tarpaulin covered trucks.	Complied. The transportation through rail is being done.
(ii)	Avenue plantation of 2/3 rows all along the road shall be carried out by the project proponent at its own expenses in consultation with the State Government Authorities.	Complied. Avenue plantation all along the road has already been done inside the plant premises.
(iii)	Periodic maintenance of the road shall be done by the project proponent at its own expenses and shall facilitate the traffic control on the road in consultation with the State Government Authorities.	Complied. The coal transportation through rail has been started. Avenue plantation all along the road has already been done inside the plant premises.
(iv) (xxxiv)	The PP shall advertise in the newspaper and place on the website, the amendment issued by the Ministry for public information. Harnessing solar power within the premises	Complied. Advertisement has been published in local daily News Papers. & details submitted with previous compliance report. Original Env. Clearance along with its amendment from time to time has been kept in public domain at the website of holding company https://www.adanipower.com/Downloads Complied.
	of the plant particularly at available	

SI. No.	Conditions of EC	Compliance Status
	rooftops shall be undertaken and status of implementation shall be submitted periodically to the Regional Office of the Ministry.	The feasibility study has been done & the work is awarded to M/s Mundra Solar PV Limited (MSPVL).
(xxxv)	Green belt shall also be developed around the Ash Pond over and above the Green Belt around the plant boundary.	Complied. Greenbelt development report is enclosed as Annexure VII.
(xxxvi)	The project proponent shall formulate a well-laid Corporate Environment Policy, 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. Raipur TPP has implemented ISO 14001:2015 under Integrated Management System consist of Environment, Health & Safety, Quality and Energy Management Systems. We have formulated a corporate policy as per the requirement of Integrated Management System (IMS), Biodiversity Conservation Policy has already been framed and incorporated in existing IMS policy.
Condit	ions of Amended EC Extension dated 04.02.	2015
(i)	Sulphur and ash contents in the coal to be used in the project shall not exceed 0.7 % and 34% respectively for at any given time. In case of variation of coal quality at any point of time, fresh reference shall be made to the Ministry for suitable amendments to environmental clearance condition wherever necessary.	Being Complied.
(ii)	The PP shall advertise in the local newspapers and place on the website, the proposed amendment for public information.	Complied. Advertisement has been published in local daily News Papers. & details submitted with previous compliance report.
Condit	ions of Amended EC Extension dated 09.12.2	2015
(i)	The Sulphur and ash contents in the coal shall not exceed 0.7 % and 34% respectively. In case of variation of coal quality at any point of time, fresh reference shall be made to the Ministry for consideration.	Being Complied. As per the Office Memorandum, MoEFCC dated; 11.11.2020, all the Thermal Power Plants (including Captive Power Plants) having Environmental Clearance can change the Coal Source (from imported to domestic, domestic to domestic, and domestic to imported) including Lignite, directly through e-auctions/short term linkage/long term linkage/other linkage options of Ministry of Coal or any organization recognized for allotting coal linkages, without seeking the amendment in Environmental Clearance.
(ii) EC am	The PP shall advertise in the local leading newspapers and place on the website, the proposed amendment of EC (after receipt from Ministry) for change in source of coal for public information.	Complied. number S.O. 1561 (E) dated 21 st May, 2020

SI. No.	Conditions of EC	Compliance Status		
SI. No.	Condition of Notification	Compliance Status		
1)	 Setting up technology solution for emission norms i) Compliance of specified emission norms for Particulate Matter, as per extent notifications and instructions of Central Pollution Control Board, issued from time to time. ii) In case of washeries, middling and rejects to be utilized in FBC (Fluidised Bed Combustion) technology based thermal power plant. Washery to have linkage for middling and rejects in Fluidised Bed Combustion plants. 	 Noted & No FBC Technology Boiler i) Technology solutions are being implemented for mitigating fugitive emissions of Particulate Matter. The Dust Extraction (DE) type dust control system is provided for controlling fugitive dust emissions from dust generation points of coal handling system. Bag filter type dust extraction system with reversable pulse jet cleaning arrangement with fan, bag filter and stacks are provided at coal crusher house. Different types of dust suppression system and water sprinkling arrangements are already installed at various probable fugitive dust generation points. Plain water dust suppression for wagon tippler complex. Plain water dust suppression for Coal stockpile. Pre-wetting system for Wagon Tripler. Dry Fog dust suppression for all Transfer points. 		
2)	 Management of Ash Ponds i) The thermal power plants shall comply with conditions, as notified in the Fly Ash notifications issued from time to time, without being entitled to additional capacity of fly ash pond (for existing power generation capacity) on ground of switching from washed coal to unwashed coal. ii) Appropriate Technology solutions shall be applied to optimise water consumption for Ash management. iii) The segregation of ash may be done at the Electro- Static Precipitator stage, if required, based on site specific conditions, to ensure maximum utilisation of fly ash 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. 	 Noted & being complied. i. Fly ash is being supplied to cement industries and brick manufacture. Fly Ash generation and utilization is regularly submitted to MoEF&CC, CPCB, CEA & CECB. Please refer to Annexure VI. ii. Water requirement is being restricted to 25 MCM. Optimization of water has been incorporated as part of plant design and COC is being maintained more than 5.0 iii. Noted & being complied to meet 100% utilization of fly ash. iv. Noted & will be complied as & when fly ash is disposed in abandoned or working mines. 		

SI. No.	Conditions of EC	Compliance Status		
3)	 Transportation i) Coal transportation may be undertaken by covered Railway wagon (railway wagons covered by tarpaulin or other means) and/or covered conveyor beyond the mine area. However, till such time enabling Rail transport/conveyer beyond infrastructure is not available, road transportation may be undertaken in trucks, covered by tarpaulin or other means. ii) It shall be ensured by the thermal power plant that a) Rail siding facility or conveyer facility is set up at or near the power plant, for transportation by rail or conveyor facility is not available, ensure that the coal is transported out from the Delivery Point of the respective mine in covered trucks (by tarpaulin or other means), or any mechanismed alaead trucks by tarpaulin by rail or conveyer 	 i) Noted & being complied. Rail siding facility has been made operational & coal is being transported through covered rail wagons ii) a) Rail siding facility has been made operational & coal is being transported through covered rail wagons b) Not applicable as Rail siding facility has been made operational & coal is being transported through covered through covered rail wagons b) Not applicable as Rail siding facility has been made operational & coal is being transported through covered through covered rail wagons 		
	,			

F. No. J.13012/62/2008-IA.II (T) Government of India Ministry of Environment, Forest and Climate Change (Impact Assessment Division)

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

Dated: 24th April, 2023

To,

M/s Adani Power Ltd. Adani House, Nr Mithakhali Circle Navrangpura, Ahmedabad- 380009 (Gujarat)

Sub: 2x685 MW Super Critical Imported Coal Based Thermal Power Plant at villages Raikheda, Gaitara and Chicholi, in Tilda Block, in Raipur Distt., in Chhattisgarh - Transfer of Environmental Clearance from M/s Raipur Energen Limited to M/s Adani Power Ltd - reg.

Sir,

This has reference to your online proposal no. IA/CG/THE/297957/2023 dated 25th February, 2023 regarding transfer of the environmental clearance for the above said project from M/s Raipur Energen Limited to M/s Adani Power Ltd.

2. The Ministry had earlier issued environmental clearance for the project 2x685 MW Super Critical Imported Coal Based Thermal Power Plant at villages Raikheda, Gaitara and Chicholi, in Tilda Block, in Raipur Distt., in Chhattisgarh in favour of M/s GMR Energy Ltd vide letter dated 9th May, 2011, followed by amendment in EC dated 13th June, 2013, 18th November, 2014, 04th February, 2015 and 9th December, 2015. The said EC was transferred by the Ministry vide Office Order dated 5th November, 2019 in the name of M/s Raipur Energen Limited from M/s GMR Energy 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 08th February, 2023, sanctioning the scheme of amalgamation of M/s Raipur Energen 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 Raipur Energen 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 9th May, 2011, followed by amendment in EC dated 13th June, 2013, 18th November, 2014, 4th February, 2015 and 9th December, 2015 issued in the name of M/s Raipur Energen Limited.

5. As per the relevant provisions of the EIA Notification, 2006, as amended, the environmental clearance granted to the project vide letter

dated 9th May, 2011 for 2x685 MW Super Critical Imported Coal Based Thermal Power Plant followed by amendment in EC dated 13th June, 2013, 18th November, 2014, 4th February, 2015 and 9th December, 2015 at villages Raikheda, Gaitara and Chicholi, in Tilda Block, in Raipur Distt., in Chhattisgarh are hereby transferred from M/s Raipur Energen 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.

(Yogendra Pal Singh) Scientist 'E' Tele: 011-20819364 Email Id: yogendra78@nic.in

Copy to: -

- 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 Member Secretary, Central Pollution Control Board, Parivesh Bhawan, CBD cum-Office Complex, East Arjun Nagar, Delhi 110 032.
- 4. The Deputy Director General of Forests (C), Integrated Regional Office, Raipur, Ground Floor, Aranya Bhawan, North Block, Sector- 19, Naya Raipur, Atal Nagar, Chhattisgarh 492 002.
- 5. The Principal Secretary Forest and Climate Change, Mahanadi Bhawan, Nawa Raipur, Atal Nagar, Raipur (CG)
- 6. The Member Secretary, Chhattisgarh Environment Conservation Board, Paryavas Bhawan, North Block Sector-19, Atal Nagar Dist – Raipur (C.G.) – 492 002.
- 7. Guard file/Monitoring file.
- 8. Website of MoEF&CC.

(Yogendra Pal Singh) Scientist 'E'

Annexure - II

ENVIRONMENTAL MONITORING REPORT



Submitted To:

M/s Raipur Energen Limited (Formerly GMR Chhattisgarh Energy Ltd.) Village- Raikheda, Block- Tilda, District- Raipur, Chhattisgarh, India. Pin Code - 493225

Study Conducted By:



M/s Vardan EnviroLab Plot No. 82 A, Sector-5, IMT Manesar, Gurugram, Haryana, India - 122051 E-mail: projects.env@vardan.co.in

(Recognized By NABL & MOEF&CC, Government of India)

Project Name: M/s Raipur Energen Limited (Formerly GMR Chhattisgarh Energy Ltd.), Village- Raikheda, Block- Tilda, District- Raipur, Chhattisgarh

4th Quarterly 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 Change, Pollution Control Boards in many folds. Besides enforcing the various Environmental Legislations MoEF&CC, CPCB & SPCB strive to propagate the necessity awareness regarding the various Legal Provisions and Environmental Protection measures in the country.

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

However, the prerequisite for sustainable development is judicious planning of Environmental Status, likely impacts of the approach adopted on the Environment including inhabitants of the locality, availability of the Eco-friendly Technology, Emerging Waste Disposal and Waste Utilization Processes, Techniques of Land Reclamation for the Restoration of aesthetic beauty and soon.

M/s Raipur Energen Limited, (Formerly GMR Chhattisgarh Energy Ltd.), Village- Raikheda, Block-Tilda, District-Raipur, Chhattisgarh, India, has engaged M/s Vardan EnviroLab, Gurugram, Haryana to provide Environmental Services in respect of Ambient Air Quality Monitoring, Ambient Noise Level Monitoring, Sampling and Analysis of Ground Water Quality, Surface Water Quality, Treated Effluent Sewage, Effluent Water from STP & ETP, Soil & Stack Emission Monitoring for M/s Raipur Energen Limited, Raipur, Chhattisgarh, as per guidelines of MoEF&CC and CPCB Gazette Notification.

M/s Vardan EnviroLab, Gurugram, Haryana has deployed entirely its own personnel, facilities and expertise for doing this service. Sampling / Monitoring Stations were identified by the Environmental Officer of M/s Raipur Energen Limited, Raipur. The samples were analyzed partly at site and partly at our MoEF&CC Recognized Laboratory situated at Gurugram, Haryana.

This report presents the data generated for the period from 20th March 2023 to 28th March 2023, i.e. for Fourth Quarter which includes Sampling Locations, Methodology, Testing Procedure and Compilation for the Environmental Parameters i.e. Air, Noise, Water, Soil & Stack 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 M/s Raipur Energen Limited, 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: 5 5 2023



Project Name: M/s Raipur Energen Limited (Formerly GMR Chhattisgarh Energy Ltd.), Village- Raikheda, Block- Tilda, District- Raipur, Chhattisgarh

4th Quarterly Environmental Monitoring Report

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4th Quarterly Environmental Monitoring Report

Chapter - 1.0

INTRODUCTION

M/s Raipur Energen Limited, a subsidiary of Adani Power, is a power generation company based at Raipur in the State of Chhattisgarh. M/s Raipur Energen Limited has commissioned its Thermal Power Plant 1370 MW (2x685 MW) Unit at Village- Raikheda, Block -Tilda, District- Raipur, Chhattisgarh, India.

M/s Raipur Energen Limited is also committed towards the Environment and the Community it operates in. It has successfully implemented several Community Welfare Schemes in the field of Livelihood, Infrastructure, Community Health and Education which has so far benefited over 60,000 people from close to 75 Villages.



Figure No.1 M/s Raipur Energen Limited

Project Name: M/s Raipur Energen Limited (Formerly GMR Chhattisgarh Energy Ltd.), Village- Raikheda, Block- Tilda, District- Raipur, Chhattisgarh

4th Quarterly Environmental Monitoring Report

Chapter - 2.0

PROJECT PROFILE

2.1 Topography & Drainage:-

Topography of this area is generally undulating. The area is drained by Raikheda Talab approximately 2.5 km. away from plant in SW direction and Bengoli Dam approximately 2.0 km. away from Plant in SW direction. Mura Talab approximately 5.0 km. away from plant in South direction, Chicholi Talab approximately 2.0 km. away from Plant in East direction.

2.2 Location:-

Plant is bounded by Northern Latitudes of 21° 26' 23" to 21° 27' 48" and Eastern Longitude of 81° 50'34.6" to 81°52'08.5". This area falls in the survey of India top sheet no. 64 G/14, 64 G/15in parts(1:50000 Scale) The location of the Plant area is shown in **Fig. No.2**

2.3 Climate:-

The climate of the area is Sub-tropical type. It is in the zone of humid tropic climate where Temperature and Humidity of air are very high. The temperature varies from the Minimum - Maximum Temperature range between 31°C - 42°C in Summer, and 8°C - 25°C in Winter. The Humidity varies from 35 % to 82 %. The Annual Average Rainfall in the area is about 1300 mm.

2.4 Communication:-

The nearest Railway Station is Tilda, which is at a distance of 14 km. towards West direction. The area is well connected with S.H. No. 9. Nearest Airport is Raipur 32 km. in SW direction. Nearest Village is Raikheda 1.5 km. in South direction and nearest Town is Raipur 31 km. in SW direction.

Project Name: M/s Raipur Energen Limited (Formerly GMR Chhattisgarh Energy Ltd.), Village- Raikheda, Block- Tilda, District- Raipur, Chhattisgarh

4th Quarterly Environmental Monitoring Report

2.5 Location Map:-



Figure No. 2. Location Map

4th Quarterly Environmental Monitoring Report

Chapter - 3.0

SCOPE OF STUDY AND METHODOLOGY

3.1 Scope of Study:-

The scope of study includes Environmental Services in respect of Ambient Air Quality Monitoring, Ambient Noise Level Monitoring & Sampling and Analysis of Ground Water Quality, Surface Water Quality, Treated Effluent Sewage, Effluent Water from ETP & STP Plant, Soil and Stack Emission Monitoring.

3.2 Methodology:-

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

3.2.1 Ambient Air Quality Monitoring:-

The Ambient Air Quality has been carried out at various sources of Air Pollution surrounding and in the Plant. The prime objective of the Ambient Air Quality Monitoring is to access the existing air quality of the area.

The Ambient Air Quality Monitoring was carried out for 24 Hours at each Station. At all Stations PM₁₀, PM_{2.5}, NO₂, SO₂, CO, C₆H₆, NH₃, O₃, Pb, As, Ni, BaP, TSPM and Mercury were monitored. All the samples collected and analyzed for Quantitative Analysis of various Pollutants. The Ambient Air Quality sampling locations were identified by the Environmental Officer of M/s Raipur Energen Limited.

3.2.2 Ambient Noise Environment:-

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

Project Name: M/s Raipur Energen Limited (Formerly GMR Chhattisgarh Energy Ltd.), Village- Raikheda, Block- Tilda, District- Raipur, Chhattisgarh

4th Quarterly Environmental Monitoring Report

3.2.3 Ground, Surface & Waste Water Environment:-

The Ground Water Samples, Surface Water Samples were collected from selected locations in two liter sterilized plastic cans. These samples were analyzed as per IS: 10500-2012. The Domestic Effluent and Industrial Effluent Samples were collected and analyzed for Parameters: pH, Total Suspended Solids, Biochemical Oxygen Demand, Chemical Oxygen Demand and Oil & Grease.

3.2.4 Soil Environment:-

The Soil Samples were collected from selected locations. These samples were analyzed for Physico-Chemical Parameters including Heavy Metals.

3.2.5 Stack Emission Monitoring:-

The Stack Samples were collected from TPP (Unit-1 & Unit-2).

Project Name: M/s Raipur Energen Limited (Formerly GMR Chhattisgarh Energy Ltd.), Village- Raikheda, Block- Tilda, District- Raipur, Chhattisgarh

4th Quarterly Environmental Monitoring Report

Chapter – 4.0

SAMPLING LOCATION MAP AND ANALYSIS REPORTS

4.1 Ambient Air Quality Monitoring:-



Figure No.3 Plan Showing Ambient Air Quality Location Map

Ambient Air Quality Monitoring Locations

Location Code:-

- A1- Village- Chicholi (Near Sunil Joshi House)
- A2- Jitendra Banjaris House (Raikheda)
- A3- Village- Gaitara
- A4- Near Petrol Pump (Mura Village)
- A5- Near Old Project Doosan
- A6- Near STP Area
- A7- Near Raw Water Area

ardan EnviroLa

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	f the Party

: M/s Raipur Energen Limited (Formerly GMR Chhaltisgarh Energy Ltd.) Village-Raikheda, Block- Tilda, Dist-Raipur, Chhattisgarh.

Report No.	÷
Format No	-
Party Reference No	1
Reporting Date	9
Period of Analysis	1
Receipt Date	i
ULR No.	

Page No. 1/2

÷	VEL/A/2303311001
:	7.8 F-03
-	5703004128 (21/04/2022)
÷	08/04/2023
-	03/04/2023-08/04/2023
ż	31/03/2023
1	TC629923200001285F

Sample Description

: Ambient Air

General Information	
Sampling Location	: Village- Chicholi (Near Sunil Joshi's House)
Sample Collected By	: VEL Representative (Mr. Chimman Lal)
Sampling Equipment used	: RDS/FPS
Instrument Code	: VEL/RDS/FPS/04
Instrument Calibration Status	Calibrated Covered at Variation Crew
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 20/03/2023 To 21/03/2023
Time of Monitoring	: 11:40 AM to 11:40 AM
Ambient Temperature (°C)	: Min.19°C, Max.34°C Victory Lowership
Surrounding Activity	: Human & Vehicular Activities
Scope of Monitoring	: Regulatory Requirement
Sampling & Analysis Protocol	: IS: 5182 & CPCB Guidlines
Sampling Duration	24.0 Hours and Vandon Knytheliah V
Parameter Required	: As per work order

S.No.	Test Parameters	Test Method	Results	Units	Limits as per CPCB
1	Particulate Matter as (PM2.5)	IS 5182 (P-24)	31.72	µg/m3	60
2	Particulate Matter as (PM10)	ardan Englis 5182 (P-23)	65.08	µg/m3	100
3	Total Suspended Particulate Matter	IS 5182 (P-4)	182.72	µg/m3	Not Specified
4	Nitrogen Dioxide as (NO2)	IS 5182 (P-6)	20.42	µg/m3	80
5	Sulphur Dioxide as (SO2)	IS 5182 (P-2)	10.94	µg/m3	80
6	#Ozone as (O3)	IS 5182 (P-9)	23.46	µg/m3	180
7	Benzene as (C6H6)	IS 5182 (P-11)	BLQ(LOQ-0.5)	µg/m3	windling Var
8	Benzo(a)pyrene as (BaP)	IS 5182 (P-12)	BLQ(LOQ-0.5)	ng/m3	1
9	Arsenic as (As)	VEL/ENV/STP/110, Issue No 01, Issue date 01/11/2021	BLQ(LOQ-0.1)	ng/m3	6
10	Lead as (Pb)	IS 5182 (P-22)	BLQ(LOQ-0.1)	µg/m3	1
11 EN	Mercury as (Hg)	VEL/ENV/STP/129, Issue No 01, Issue date 01/11/2021	BLQ(LOQ-1.0)	ng/m3	Not Specified

Terms & Conditions

. The results reported relate only to the samples tested. In case sa tole is not drawn the results apply to the sample as received.

This test report in full or in part, shall not be reproduced in any court of tax without, prior written approval of the laboratory.
 To confirm the authenticity of this perticute of analysis, please contact us through enail at lability-order or in

· Laboratory is not responsible for the authenticity of photocopied lest report. The test samples will be retained only for specific period

hecked By

The report no. with Suffix A-Attended Report.

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GUSEY

(Approved By)



Test Report

ample	Number: VEL/A/01		Report No.	: VEL/A/2303	311001
S.No.	Test Parameters	Test Method	Results	Units	Limits as per CPCB
12	Nickel as (Ni)	IS 5182 (P-26)	BLQ(LOQ-5.0)	ng/m3	20
13	#Carbon Monoxide (by NDIR)	IS 5182 (P-10)	0.64	mg/m3	4

#-indicates 1 hour monitoring of CO & Ozone

BLQ- Below Limit of Quantification, LOQ- Limit of Quantification

***End of Report*

Dmi (Checked B Approved By)

Terms & Conditions

- . The results reported relate only to the same
- This less report in full or in part, shall not be reproduced in any court of lew without prior written approval of the laboratory.
 To confirm the authenticity of this partificate of analysis, please contact us through email at labiglyanden co.in
- Laboratory is not responsible for the authenticity of proto
 The report no. with Suffix A-Amended Report. pied lest report T w hot samples will be retained o
- This test report will not be used for publicity or advertising or credul purpose without prior written permission on the laboratory
 Giving opinions does not imply and/reserved of the tested sample by the lab. Under no circumstances, the lab accepts any la d by the use or misute of the lest tecc

pini

ardan Enviro

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

Test Report

Sample Number : VEL/A/02 Name & Address of the Party

: M/s Raipur Energen Limited (Formerly GMR Chhattisgarh Energy Ltd.) Village-Raikheda, Block- Tilda, Dist-Raipur, Chhattisgarh.

Report No.	8
Format No	
Party Reference No	
Reporting Date	
Period of Analysis	
Receipt Date	
ULR No.	

Page No. 1/2

:	VEL/A/2303311002
	7.8 F-03
1	5703004128 (21/04/2022)
1	08/04/2023
1	03/04/2023-08/04/2023
4	31/03/2023
:	TC629923200001286F

Sample Description

: Ambient Air

Sampling Location	: Jitendra Banian's House (Raikheda)
Sample Collected By	: VEL Representative (Mr. Chimman Lal)
Sampling Equipment used	: RDS/FPS
Instrument Code	: VEL/RDS/FPS/04
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 21/03/2023 To 22/03/2023
Time of Monitoring	: 12:00 AM to 12:00 AM
Ambient Temperature (°C)	: Min. 16°C, Max.34°C
Surrounding Activity	: Human & Vehicular Activities
Scope of Monitoring	: Regulatory Requirement
Sampling & Analysis Protocol	: IS: 5182 & CPCB Guidlines
Sampling Duration	: 24.0 Hours
Parameter Required	: As per work order

S.No.	Test Parameters	Test Method	Results	Units	Limits as per CPCB
1	Particulate Matter as (PM2.5)	IS 5182 (P-24)	30.11	µg/m3	60
2	Particulate Matter as (PM10)	Indon Devi IS 5182 (P-23)	61.98	µg/m3	100
3	Total Suspended Particulate Matter	IS 5182 (P-4)	174.42	µg/m3	Not Specified
4	Nitrogen Dioxide as (NO2)	IS 5182 (P-6)	16.16	µg/m3	80
5	Sulphur Dioxide as (SO2)	IS 5182 (P-2)	7.49	µg/m3	Lab V80 dam
6	#Ozone as (O3)	IS 5182 (P-9)	18.46	µg/m3	180
7	Benzene as (C6H6)	IS 5182 (P-11)	BLQ(LOQ-0.5)	µg/m3	odroLas Var
8	Benzo(a)pyrene as (BaP)	IS 5182 (P-12)	BLQ(LOQ-0.5)	ng/m3	1
9	Arsenic as (As)	VEL/ENV/STP/110, Issue No 01, Issue date 01/11/2021	BLQ(LOQ-0.1)	ng/m3	Male V 6 diin Wirolab Vari
10	Lead as (Pb)	IS 5182 (P-22)	BLQ(LOQ-0.1)	µg/m3	1
11	Mercury as (Hg)	VEL/ENV/STP/129, Issue No 01, Issue date 01/11/2021	BLQ(LOQ-1.0)	ng/m3	Not Specified



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Test Report

ample	Number: VEL/A/02		Report No.	: VEL/A/2303	311002
S.No.	Test Parameters	Test Method	Results	Units	Limits as per CPCB
12	Nickel as (Ni)	IS 5182 (P-26)	BLQ(LOQ-5.0)	ng/m3	20
13	#Carbon Monoxide (by NDIR)	IS 5182 (P-10)	0.65	mg/m3	4

monitoring of CO & Ozone

BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.

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

Report No.

Format No

Party Reference No

Period of Analysis

Reporting Date

Receipt Date

ULR No.

Sample Number : VEL/A/03 Name & Address of the Party

: M/s Raipur Energen Limited (Formerly GMR Chhattisgarh Energy Ltd.) Village-Raikheda, Block- Tilda, Dist-Raipur, Chhattisgarh.

Sample Description

Ambient Air

1	Village- Gaitara
:	VEL Representative (Mr. Chimman Lal)
:	RDS/FPS
	VEL/RDS/FPS/04
10	Calibrated
9	Clear Sky
1	22/03/2023 To 23/03/2023
1	12:10 PM to 12:10 PM
14	Min.19°C, Max.35.7°C
13	Human & Vehicular Activities
1	Regulatory Requirement
	IS: 5182 & CPCB Guidlines
1	24.0 Hours
1	As per work order

S.No.	Test Parameters	Test Method	Results	Units	Limits as per CPCB
1	Particulate Matter as (PM2.5)	IS 5182 (P-24)	33.42	µg/m3	60
2	Particulate Matter as (PM10)	IS 5182 (P-23)	64.92	µg/m3	100
3	Total Suspended Particulate Matter	IS 5182 (P-4)	181.41	µg/m3	Not Specified
4	Nitrogen Dioxide as (NO2)	IS 5182 (P-6)	17.66	µg/m3	80
5	Sulphur Dioxide as (SO2)	IS 5182 (P-2)	9.11	µg/m3	80
6	#Ozone as (O3)	IS 5182 (P-9)	15.06	µg/m3	180
7	Benzene as (C6H6)	IS 5182 (P-11)	BLQ(LOQ-0.5)	µg/m3	5
8	Benzo(a)pyrene as (BaP)	IS 5182 (P-12)	BLQ(LOQ-0.5)	ng/m3	1
9	Arsenic as (As)	VEL/ENV/STP/110, Issue No 01, Issue date 01/11/2021	BLQ(LOQ-0.1)	ng/m3	6
10	Lead as (Pb)	IS 5182 (P-22)	BLQ(LOQ-0.1)	µg/m3	1
11	Mercury as (Hg)	VEL/ENV/STP/129, Issue No 01, Issue date 01/11/2021	BLQ(LOQ-1.0)	ng/m3	Not Specified



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: VEL/A/2303311003

: 5703004128 (21/04/2022)

: 03/04/2023-08/04/2023

: TC629923200001287F

: 7.8 F-03

: 08/04/2023

- 31/03/2023

Page No. 1/2

Ph: 0124-4343750, 9953147268, 9810355569 | E-mail: lab@vardan.co.in, bd@vardan.co.in | www.vardan.co.in



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Test Report

ample	Number : VEL/A/03		Report No.	; VEL/A/2303	311003
S.No.	Test Parameters	Test Method	Results	Units	Limits as per CPCB
12	Nickel as (Ni)	IS 5182 (P-26)	BLQ(LOQ-5.0)	ng/m3	20
13	#Carbon Monoxide (by NDIR)	IS 5182 (P-10)	0.66	mg/m3	4

#-indicates 1 hour monitoring of CO & Ozone

BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.

End of Report



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Vardan EnviroLa

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 Raipur Energen Limited (Formerly GMR Chhattisgarh Energy Ltd.) Village-Raikheda, Block- Tilda, Dist-Raipur, Chhattisgarh.

Report No.	3	VI
Format No	:	7.
Party Reference No	:	57
Reporting Date	:	08
Period of Analysis	:	03
Receipt Date	:	31
ULR No.		T

Page No. 1/2

	: VEL/A/2303311004
	: 7.8 F-03
0	: 5703004128 (21/04/2022)
	: 08/04/2023
¢.	: 03/04/2023-08/04/2023
	: 31/03/2023
	; TC629923200001288F

Sample Description

: Ambient Air

General Information		
Sampling Location	1	Near Petrol Pump (Mura Village)
Sample Collected By	4	VEL Representative (Mr. Chimman Lal
Sampling Equipment used	1	RDS/FPS
Instrument Code	:	VEL/RDS/FPS/05
Instrument Calibration Status	1.4	Calibrated
Meteorological condition during monitoring	1	Clear Sky 1911-1020 Vincing Univ
Date of Monitoring	:	22/03/2023 To 23/03/2023
Time of Monitoring	:	12:30 PM to 12:30 PM
Ambient Temperature ("C)	:	Min. 19°C, Max. 35.7°C
Surrounding Activity	1	Human & Vehicular Activities
Scope of Monitoring	1	Regulatory Requirement
Sampling & Analysis Protocol	1	IS: 5182 & CPCB Guidlines
Sampling Duration	12	24.0 Hours
Parameter Required	1.1	As per work order

S.No.	Test Parameters	Test Method	Results	Units	Limits as per CPCB
1	Particulate Matter as (PM2.5)	1S 5182 (P-24)	27.42	µg/m3	60
2	Particulate Matter as (PM10)	IS 5182 (P-23)	51.88	µg/m3	100
3	Total Suspended Particulate Matter	IS 5182 (P-4)	152.11	µg/m3	Not Specified
4	Nitrogen Dioxide as (NO2)	IS 5182 (P-6)	21.17	µg/m3	80
5	Sulphur Dioxide as (SO2)	IS 5182 (P-2)	10.88	µg/m3	plab V80 dam
6	#Ozone as (O3)	IS 5182 (P-9)	17.42	µg/m3	180
7	Benzene as (C6H6)	IS 5182 (P-11)	BLQ(LOQ-0.5)	µg/m3	virolas Vav
8	Benzo(a)pyrene as (BaP)	IS 5182 (P-12)	BLQ(LOQ-0.5)	ng/m3	Strangentin
9	Arsenic as (As)	VEL/ENV/STP/110, Issue No 01, Issue date 01/11/2021	BLQ(LOQ-0.1)	ng/m3	tab V 6 dans viroLab Varo
10	Lead as (Pb)	IS 5182 (P-22)	BLQ(LOQ-0.1)	µg/m3	1
11	Mercury as (Hg)	VEL/ENV/STP/129, Issue No 01, Issue date 01/11/2021	BLQ(LOQ-1.0)	ng/m3	Not Specified



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Test Report

ample	Number: VEL/A/04		Report No.	: VEL/A/2303	311004
S.No.	Test Parameters	Test Method	Results	Units	Limits as per CPCB
12	Nickel as (Ni)	IS 5182 (P-26)	BLQ(LOQ-5.0)	ng/m3	20
13	#Carbon Monoxide (by NDIR)	IS 5182 (P-10)	0.62	mg/m3	4

#-indicates 1 hour monitoring of CO & Ozone

BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.

'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

Sample Number : VEL/A/05 Name & Address of the Party

: M/s Raipur Energen Limited (Formerly GMR Chhattisgarh Energy Ltd.) Village-Raikheda, Block- Tilda, Dist-Raipur, Chhattisgarh.

Sample Description

: Ambient Air

General Information	111	Maar
Pamping Collected D		reear c
Sample Collected By	1	VEL R
Sampling Equipment used	1.1	RDS/F
Instrument Code	1	VEL/R
Instrument Calibration Status	14	Calibra
Meteorological condition during monitoring	1	Clear :
Date of Monitoring	1	23/03/
Time of Monitoring	1	12:00
Ambient Temperature ("C)	1	Min.20
Surrounding Activity	:	Huma
Scope of Monitoring	1	Regula
Sampling & Analysis Protocol	4	IS: 51
Sampling Duration	:	24.0 H
Parameter Required		As per
	General Information Sampling Location Sample Collected By Sampling Equipment used Instrument Code Instrument Calibration Status Meteorological condition during monitoring Date of Monitoring Time of Monitoring Ambient Temperature (°C) Surrounding Activity Scope of Monitoring Sampling & Analysis Protocol Sampling Duration Parameter Required	General Information Sampling Location Sample Collected By Sampling Equipment used Instrument Code Instrument Calibration Status Meteorological condition during monitoring Date of Monitoring Time of Monitoring Ambient Temperature (*C) Surrounding Activity Scope of Monitoring Sampling & Analysis Protocol Sampling Duration Parameter Required

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Near Old Projec	t Doosan
VEL Representa	ative (Mr. Chimman Lai)
RDS/FPS	
VEL/RDS/FPS/	02
Calibrated	
Clear Sky	
23/03/2023 To 2	24/03/2023
12:00 PM to 12	00 PM
Min.20°C. Max.	33.1°C

Report No.

Format No

Party Reference No

Reporting Date Period of Analysis

/EL/RDS/FPS/02	
Calibrated	
Clear Sky	
23/03/2023 To 24/03/2023	
12:00 PM to 12:00 PM	
Min.20°C, Max.33.1°C	
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1	12:00 PM to 12:00 PM
14	Min.20°C, Max.33.1°C
1	Human & Vehicular Activities
1	Regulatory Requirement
4	IS: 5182 & CPCB Guidlines
	24 O Maure

work order

S.No.	Test Parameters	Test Method	Results	Units	Limits as per CPCB
1	Particulate Matter as (PM2.5)	IS 5182 (P-24)	29.76	µg/m3	60
2	Particulate Matter as (PM10)	IS 5182 (P-23)	59.07	µg/m3	100
3	Total Suspended Particulate Matter	IS 5182 (P-4)	164.82	µg/m3	Not Specified
. 4	Nitrogen Dioxide as (NO2)	IS 5182 (P-6)	17.42	µg/m3	80
5	Sulphur Dioxide as (SO2)	IS 5182 (P-2)	8.11	µg/m3	80
6	#Ozone as (O3)	IS 5182 (P-9)	18.07	µg/m3	180
7	Benzene as (C6H6)	IS 5182 (P-11)	BLQ(LOQ-0.5)	µg/m3	Wirol 5 Vin
8	Benzo(a)pyrene as (BaP)	IS 5182 (P-12)	BLQ(LOQ-0.5)	ng/m3	1
9	Arsenic as (As)	VEL/ENV/STP/110, Issue No 01, Issue date 01/11/2021	BLQ(LOQ-0.1)	ng/m3	6
10	Lead as (Pb)	IS 5182 (P-22)	BLQ(LOQ-0.1)	µg/m3	1
11	Mercury as (Hg)	VEL/ENV/STP/129, Issue No 01, Issue date 01/11/2021	BLQ(LOQ-1.0)	ng/m3	Not Specified



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: VEL/A/2303311005

: 5703004128 (21/04/2022)

: 03/04/2023-08/04/2023

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: 08/04/2023

: 31/03/2023

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



Test Report

ample	Number: VEL/A/05		Report No.	; VEL/A/2303	311005
S.No.	Test Parameters	Test Method	Results	Units	Limits as per CPCB
12	Nickel as (Ni)	IS 5182 (P-26)	BLQ(LOQ-5.0)	ng/m3	20
13	#Carbon Monoxide (by NDIR)	IS 5182 (P-10)	0.53	mg/m3	4

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

Report No.

Format No

ULR No.

Party Reference No

Period of Analysis **Receipt Date**

Reporting Date

Sample Number : VEL/A/06 Name & Address of the Party

: M/s Raipur Energen Limited (Formerly GMR Chhaltlisgarh Energy Ltd.) Village-Raikheda, Block- Tilda, Dist-Raipur, Chhattisgarh.

Sample Description

: Ambient Air

General Information Sampling Location Sample Collected By Sampling Equipment used Instrument Code Instrument Calibration Status Meteorological condition during monitoring **Date of Monitoring Time of Monitoring** Ambient Temperature (*C) Surrounding Activity Scope of Monitoring Sampling & Analysis Protocol Sampling Duration Parameter Required

Near STP Area VEL Representative (Mr. Chimman RDS/FPS VEL/RDS/FPS/03 Calibrated Clear Sky 23/03/2023 To 24/03/202 12:15 PM to 12:15 PM Min.16°C, Max.33.9°C Human & Vehicular Activitie Regulatory Requirement IS: 5182 & CPCB Guidlini 24.0 Hours

	· As per work order				
S.No.	Test Parameters	Test Method	Results	Units	Limits as per CPCB
1	Particulate Matter as (PM2.5)	IS 5182 (P-24)	32.42	µg/m3	60
2	Particulate Matter as (PM10)	IS 5182 (P-23)	5 Va 64.11 Envi	µg/m3	100
3	Total Suspended Particulate Matter	IS 5182 (P-4)	173.11	µg/m3	Not Specified
4	Nitrogen Dioxide as (NO2)	IS 5182 (P+6)	18.07	µg/m3	80
5	Sulphur Dioxide as (SO2)	IS 5182 (P-2)	8.26	µg/m3	80
6	#Ozone as (O3)	IS 5182 (P-9)	21.72	µg/m3	180
7	Benzene as (C6H6)	IS 5182 (P-11)	BLQ(LOQ-0.5)	µg/m3	wirol.s. Vard
8	Benzo(a)pyrene as (BaP)	IS 5182 (P-12)	BLQ(LOQ-0.5)	ng/m3	1
9	Arsonic as (As)	VEL/ENV/STP/110, Issue No 01, Issue date 01/11/2021	BLQ(LOQ-0.1)	ng/m3	Nab V6 dan t Virolab Varda
10	Lead as (Pb)	IS 5182 (P-22)	BLQ(LOQ-0.1)	µg/m3	ining 1. Vari
11	Mercury as (Hg)	VEL/ENV/STP/129, Issue No 01, Issue date 01/11/2021	BLQ(LOQ-1.0)	ng/m3	Not Specified



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· VEL/A/2303311006

: 5703004128 (21/04/2022)

: 03/04/2023-08/04/2023

TC6299232000012908

: 7.8 F-03

: 08/04/2023

: 31/03/2023

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Test Report

ample	Number : VEL/A/06		Report No.	: VEL/A/2303	311006
S.No.	Test Parameters	Test Method	Results	Units	Limits as per CPCB
12	Nickel as (Ni)	IS 5182 (P-26)	BLQ(LOQ-5.0)	ng/m3	20
13	#Carbon Monoxide (by NDIR)	IS 5182 (P-10)	0.55	mg/m3	4

#-indicates 1 hour monitoring of CO & Ozone

BLQ- Below Limit of Quantification LOQ- Limit of Quantification.

***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

Sample Number : VEL/A/07 Name & Address of the Party

Sample Description

: M/s Raipur Energen Limited (Formerly GMR Chhattisgarh Energy Ltd.) Village-Raikheda, Block- Tilda, Dist-Raipur, Chhattisgarh.

: Ambient Air

Report No.	÷
Format No	:
Party Reference No	:
Reporting Date	:
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VEL/A/2303311007

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7.8 F-03 5703004128 (21/04/2022) 08/04/2023 03/04/2023-08/04/2023 31/03/2023

: TC629923200001291F

General Information Sampling Location	1 Near Daw Water Area
Sample Collected By	: VEL Representative (Mr. Chimman Lal)
Sampling Equipment used	: RDS/FPS
Instrument Code	: VEL/RDS/FPS/01
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 23/03/2023 To 24/03/2023
Time of Monitoring	: 12:30 PM to 12:30 PM
Ambient Temperature (*C)	: Min.19°C, Max.34.6°C
Surrounding Activity	: Human & Vehicular Activities
Scope of Monitoring	: Regulatory Requirement
Sampling & Analysis Protocol	: IS: 5182 & CPCB Guidlines
Sampling Duration	: 24.0 Hours
Parameter Required	: As per work order

S.No.	Test Parameters	Test Method	Results	Units	Limits as per CPCB
1	Particulate Matter as (PM2.5)	IS 5182 (P-24)	33.86	µg/m3	60
2	Particulate Matter as (PM10)	IS 5182 (P-23)	62.11	µg/m3	100
3	Total Suspended Particulate Matter	IS 5182 (P-4)	178.11	µg/m3	Not Specified
4	Nitrogen Dioxide as (NO2)	IS 5182 (P-6)	16.42	µg/m3	80
5	Sulphur Dioxide as (SO2)	IS 5182 (P-2)	6.98	µg/m3	80
6	#Ozone as (O3)	IS 5182 (P-9)	19.22	µg/m3	180
7	Benzene as (C6H6)	IS 5182 (P-11)	BLQ(LOQ-0.5)	µg/m3	mirolas Van
8	Benzo(a)pyrene as (BaP)	IS 5182 (P-12)	BLQ(LOQ-0.5)	ng/m3	1
9	Arsenic as (As)	VEL/ENV/STP/110, Issue No 01, Issue date 01/11/2021	BLQ(LOQ-0.1)	ng/m3	Cab V 6 dan Protato Vari
10	Lead as (Pb)	IS 5182 (P-22)	BLQ(LOQ-0.1)	µg/m3	1
11	Mercury as (Hg)	VEL/ENV/STP/129, Issue No 01, Issue date 01/11/2021	BLQ(LOQ-5.0)	ng/m3	Not Specified



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Test Report

ample Number : VEL/A/07			Report No.	: VEL/A/2303311007	
S.No.	Test Parameters	Test Method	Results	Units	Limits as per CPCB
12	Nickel as (Ni)	IS 5182 (P-26)	BLQ(LOQ-5.0)	ng/m3	20
13	#Carbon Monoxide (by NDIR)	IS 5182 (P-10)	0.58	mg/m3	4

#-indicates 1 hour monitoring of CO & Ozone

BLQ- Below Limit of Quantification,LOQ- Limit of Quantification.

***End of Report



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Project Name: M/s Raipur Energen Limited (Formerly GMR Chhattisgarh Energy Ltd.), Village- Raikheda, Block- Tilda, District- Raipur, Chhattisgarh

4th Quarterly Environmental Monitoring Report

4.2 Ambient Noise Level Monitoring:-



Figure No. 4 Plan Showing Noise Level Monitoring Location Map

Ambient Noise Level Monitoring Locations

Location Code: -

- N1- Near Occupational Health Centre
 - N2- Near Weigh Bridge
 - N3- Near Admin Building
 - N4- Field Hostel
 - N5- Gate No. 3 (Bhatapura)
 - N6- Near Mura Village Gate
 - N7- Gaitara Gate No. 2
 - N8- Near Main Gate No. 1

M/s Vardan EnviroLab, Plot No. 82A, Sector-5, IMT Manesar, Gurugram, Haryana - 122051 Page | 23

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



Page No. 1/1

Test Report

Sample Number : VEL/N/01 Name & Address of the Party

: M/s Raipur Energen Limited (Formerly GMR Chhattisgarh Energy Ltd.) Village-Raikheda, Block- Tilda, Dist-Raipur, Chhattisgarh,

Sample Description

General Information Sampling Location Sample Sampling Instrume Instrume Meteorol Date of M Time of I Ambient Surround Scope of Sampling Samplin Paramet

AMBIENT NOISE

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TC629923200001404F

Test Me	thod
er Required	As per work order
g Duration	: 24.0 Hours
g & Analysis Protocol	: CPCB Guidlines & IS:9989
Monitoring	Regulatory Requirement
ding Activity	: Human & Vehicular Activities
Temperature (°C)	: Min, 18°C, Max.35.2°C
Monitoring	: 06:00 AM to 06:00 AM
Monitoring Version Lines of the Ver	: 21/03/2023 To 22/03/2023
ogical condition during monitoring	Clear Sky mense all Vardam Sho
nt Calibration Status	: Calibrated
nt Code	: VEL/SLM/01
g Equipment used	Sound Level Meter
Collected By	: VEL Representative (Mr. Chimman Lal)
The Resident and Manufactured	· wear occupational meanin centre

S.No.	Parameters	endani CTest Method and an Envirollab Vandan Envir Vandan Envirollab Vandan In Envirollab Vandan Envirollab	Thursday Vindan Test Results Vindan Envirol.		
in Li in Li	viroLab Varian Engine at variantes of variantes of the va		Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 6:00 am)	ian Eris Jah Vaj Indan F
1	Lequal ab Vardan Envirot	I S-9989	63,84	56,11 an Em-	dB (A)
2	CPCB Limits in dB(A*) Leq (Industrial Area)	num Ellorideala Variaa InviroLata Varidan Envi Varidata EnviroLata Vari	not ab Vardan EmiroLab	Pardan Envrolub Van	dB (A)
3	CPCB Limits in dB(A*) Leq (Residential Area)	i EiseiroLab-Vardan En dan ErivirnLab Vardar	verblab Vard 55 Envirol. El virol ab Vardan Envir	a Vardan E 45 motab Ye Hab Vardan Envirote	dB (A)
4	CPCB Limits in dB(A*) Leq (Commercial Area)	dan Envirotab Vanla Invirotab Vardan Envi	65	at ab Vard ⁵⁵ Envirola	dB (A)
5	CPCB Limits in dB(A*) Leq (Silent Zone)	laroan EnvigeLab Vari EnviroLab Vardan En	50	40 verdan Cale V	dB (A)

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Note-*A "decibel" is a unit in which noise is measured.



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Test Report

Sample Number : **VEL/N/02** Name & Address of the Party

: M/s Raipur Energen Limited (Formerly GMR Chhattisgarh Energy Ltd.) Village-Raikheda, Block- Tilda, Dist-Raipur, Chhattisgarh.

Sample Description

General Information Sampling Location Sample Collected By Sampling Equipment used Instrument Code Instrument Calibration Status Meteorological condition during monitoring 2 **Date of Monitoring Time of Monitoring** Ambient Temperature (°C) Surrounding Activity Scope of Monitoring Sampling & Analysis Protocol Sampling Duration **Parameter Required**

: AMBIENT NOISE

Near Weigh Bridge VEL Representative (Mr. Chimman Sound Level Meter VEL/SLM/02 Calibrated Clear Sky 21/03/2023 To 22/03/202 06:00 AM to 06:00 AM Min.18°C, Max.35.2°C Human & Vehicular Activitie **Regulatory Requirement** CPCB Guidlines & 15:9985 24.0 Hours : As per work order

Report No.		
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Period of Analysis	:	03/
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Page No. 1/1

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	Wardan Devind Die Vande Scholas Vanden berne obei Scholas Seettat ab Varde		Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 6:00 am)	lan En Lab Va Indan I
1	Leq	I S-9989	61.94	50.88	dB (A)
2	CPCB Limits in dB(A*) Leq (Industrial Area)	neirolab Vantor I nyi	75	70 Faritan Envirol ab Var	dB (A)
3	CPCB Limits in dB(A*) Leq (Residential Area)	Emérolah-Verden En dan Enviraturb Marca	vir al. da Varo 55 Environt de	i Vandan 1 45 virotalı V plah Vandan Erwirota	dB (A)
4	CPCB Limits in dB(A*) Leq (Commercial Area)	dam karvir of six Versian netrol als Vierdan Fred	t which 65	otab Unrd ⁵⁵ Emirola	dB (A)
5	CPCB Limits in dB(A*) Leq (Silent Zone)	Unitional Portas En	50	SiroLab Ve 40 en Enviro e Vantan FassioLah V	dB (A)

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Test Report

Sample Number : VEL/N/03 Name & Address of the Party

: M/s Raipur Energen Limited (Formerly GMR Chhattisgarh Energy Ltd.) Village-Raikheda, Block- Tilda, Dist-Raipur, Chhattisgarh,

Sample Description

General Information		ULF
Sampling Location	13	Near Admin Building
Sample Collected By	. :	VEL Representative (Mr. Chir
Sampling Equipment used	:	Sound Level Meter
Instrument Code		VEL/SLM/01
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	22/03/2023 To 23/03/2023
Time of Monitoring	4	06:00 AM to 06:00 AM
Ambient Temperature (°C)	:	Min.19°C, Max.35.7°C
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Sampling & Analysis Protocol	1	CPCB Guidlines & IS:9989
Sampling Duration	1	24.0 Hours
Parameter Required	:	As per work order

: AMBIENT NOISE

Report No.	
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(Mr. Chimman Lal)

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	: VEL/N/2303311003
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	: 03/04/2023-08/04/2023
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	Varitin EnviroLab Varidei I vinet de Variden EnviroLab 15 Varitar EnviroLab Verder		Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 6:00 am)	ian finn Dia Vali NGC 1
1	Legisotali Vardan Confect	I S-9989	60.88	51.92	dB (A)
2	CPCB Limits in dB(A*) Leq (Industrial Area)		75	70	dB (A)
3	CPCB Limits in dB(A*) Leq (Residential Area)	tentra da entre da composita da Ono Construction Varidad	55	45 OLD V	dB (A)
4	CPCB Limits in dB(A*) Leq (Commercial Area)	den Engen Tole Verda	65	55	dB (A)
5	CPCB Limits in dB(A*) Leq (Silent Zone)	in the Tree is a striking Lucked II. Version Pr	50	40	dB (A)

Note-"A "decibel" is a unit in which noise is measured

End of Report



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: 31/03/2023

Test Report

Report No.

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Party Reference No

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Reporting Date

Receipt Date

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Sample Number : VEL/N/04 Name & Address of the Party

: M/s Raipur Energen Limited (Formerly GMR Chhaltisgarh Energy Ltd.) Village-Raikheda, Block- Tilda, Dist-Raipur, Chhattisgarh,

Sample Description

General Information Sampling Location **Field Hostel** Sample Collected By VEL Representative (Mr. Chimman Lal Sampling Equipment used Sound Level Meter Instrument Code VEL/SLM02 Instrument Calibration Status Calibrated Meteorological condition during monitoring Clear Sky **Date of Monitoring** 22/03/2023 To 23/03/2023 **Time of Monitoring** 06:00 AM to 06:00 AM Ambient Temperature (°C) Min. 19°C. Max 35.7°C Surrounding Activity Human & Vehicular Activitie Scope of Monitoring **Regulatory Requirement** Sampling & Analysis Protocol CPCB Guidlines & IS:9989 Sampling Duration 24.0 Hours Parameter Required As per work order

: AMBIENT NOISE

S.No.	Parameters dan Envirolab V	Test Method	a I minotali Vandan Test	Results	Units
an Li	virol.ab Værdan Envirol.al ib Vardan Envirol.ab Værda		Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 6:00 am)	ab Vai rdân E
1	LegiroLab Vardan Envirol	I S-9989	51.96	40.88	dB (A)
2	CPCB Limits in dB(A*) Leq (Industrial Area)	EnviroLab Vardan Envi	75	70	dB (A)
3	CPCB Limits in dB(A*) Leq (Residential Area)	n LoviroLabə/ardan En rdən EnviroLab Vardar	via altata Var d 55 Cardinata 16 minot alt Var dan Errei	45	dB (A)
4	CPCB Limits in dB(A*) Leq (Commercial Area)	rdan EdviroTab Varias Envirot ab Varias Envi	E poir al abo 65 alam Enve	state Vice 55, received a	dB (A)
5	CPCB Limits in dB(A*) Leq (Silent Zone)	Varian Envi <u>s</u> otab Vari n Envirotab Varian En	50	40 M Louis V	dB (A)

Note-"A "decibel" is a unit in which noise is measured



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Test Report

Sample Number : VEL/N/05 Name & Address of the Party

: M/s Raipur Energen Limited

(Formerly GMR Chhattisgarh Energy Ltd.) Village-Raikheda, Block-Tilda, Dist-Raipur, Chhattisgarh.

Sample Description

Description : AMBIENT NOISE General Information Sampling Location Sample Collected By Sampling Equipment used Instrument Code Instrument Calibration Status Meteorological condition during monitoring Date of Monitoring Time of Monitoring Ambient Temperature ("C) Surrounding Activity Scope of Monitoring Sampling & Analysis Protocol

Sampling & Analysis Protocol Sampling Duration Parameter Required Gate No-3 (Bhatapara) VEL Representative (Mr. Chimman L Sound Level Meter VEL/SLM/01 Calibrated Clear Sky 23/03/2023 To 24/03/2023 06:00 AM to 06:00 AM Min.19°C, Max 33.9°C Human & Vehicular Activities Regulatory Requirement CPCB Guidlines & IS:9969 24.0 Hours As per work order

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in Er Irola	viroLab Varian EnviroLab Variat b Varian EnviroLab Variat		Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 6:00 am)	an Ini ah Va chin i
1	Leg not an Vardam Envirot	I S-9989	54.86	44.82	dB (A)
2	CPCB Limits in dB(A*) Leq (Industrial Area)	rdan Enviret ab Vardan ovirotab Vardan Corri	75	at als Vara 70 Envirota	dB (A)
3	CPCB Limits in dB(A*) Leq (Residential Area)	EnviroLab+Vardan En dan EnviroLah Varda	55	Verdan 45 rotati V	dB (A)
4	CPCB Limits in dB(A*) Leq (Commercial Area)	dan Envirolab Verda	65 Course	ate Vand 55 EnviroLa	dB (A)
5	CPCB Limits In dB(A*) Leq (Silent Zone)	ardan Envisolah Vari Envirolah Vardan En	50	40	dB (A)

Note-"A "decibel" is a unit in which noise is measured.

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Page No. 1/1

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- 31/03/2023

Test Report

Report No.

Format No

Party Reference No.

Period of Analysis

Reporting Date

Receipt Date

Sample Number : VEL/N/06 Name & Address of the Party

 M/s Raipur Energen Limited
 (Formerly GMR Chhattisgarh Energy Ltd.) Village-Raikheda, Block- Tilda, Dist-Ralpur, Chhattisgarh.

: AMBIENT NOISE

Sample Description

	10.00 Ma
General Information	ULK NO.
Sampling Location	: Near Mura Village Gate
Sample Collected By	: VEL Representative (Mr. Chimman Lal)
Sampling Equipment used	: Sound Level Meter
Instrument Code	: VEL/SLM/02
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 23/03/2023 To 24/03/2023
Time of Monitoring	: 05:00 AM to 06:00 AM
Ambient Temperature (*C)	: Min.19*C, Max.33.7*C
Surrounding Activity	: Human & Vehicular Activities
Scope of Monitoring	: Regulatory Requirement
Sampling & Analysis Protocol	: CPCB Guidlines & IS:9989
Sampling Duration	: 24.0 Hours
Parameter Required	: As per work order

S.No.	Parameters	Test Method	til wirotab Varden Test	Test Results		
in L	whether bound of Var book whether Version Courts and the Version Energy of Although the		Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 6:00 am)	ab Var dus f	
1	Leq	1 \$-9989	51.06	42.11	dB (A)	
2	CPCB Limits in dB(A*) Leq (Industrial Area)	one control all the second	75	antan Engradula Van	dB (A)	
3	CPCB Limits in dB(A*) Leq (Residential Area)	Cincle all State Services The and Theorem of Constant	55	Manufactor 145 Anotaio Va	dB (A)	
4	CPCB Limits in dB(A*) Leq (Commercial Area)	Contractor Table Version	65	55	dB (A)	
5	CPCB Limits in dB(A*) Leq (Silent Zone)	instances in the Unit	50	40 million 40 million for the	dB (A)	

Note-"A "decibel" is a unit in which noise is measured.

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Test Report

Sample Number : VEL/N/07 Name & Address of the Party

: M/s Raipur Energen Limited (Formerly GMR Chhattisgarh Energy Ltd.) Village-Raikheda, Block- Tilda, Dist-Raipur, Chhattisgarh.

2

Sample Description

General Information Sampling Location Sample Collected By Sampling Equipment used Instrument Code Instrument Calibration Status Meteorological condition during monitoring **Date of Monitoring Time of Monitoring** Ambient Temperature (°C) Surrounding Activity Scope of Monitoring Sampling & Analysis Protocol Sampling Duration **Parameter Required**

: AMBIENT NOISE

Gaitara Gate No-2 VEL Representative (Mr. Chimman Lal) Sound Level Meter VEL/SLM/01 Calibrated Clear Sky 24/03/2023 To 25/03/2023 06:00 AM to 06:00 AM Min.20°C, Max.37.5°C Human & Vehicular Activitie **Regulatory Requirement** CPCB Guidlines & IS:9989 24.0 Hours As per work order

Report No.	1
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	Verdan EnviroLab Verdar ViroLab Varden EnviroLat b Vardan EnviroLab Vard		Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 6:00 am)	lan Len Jab Va Indan E	
1	Leg rolab Vardan Crivingt	I S-9989	61.42	50.82	dB (A)	
2	CPCB Limits in dB(A*) Leq (Industrial Area)	Inden forvir ogala Varion Inden Envi	rot ab Varda 75	aLab Vard 70 Hindrota Terdan EnviroLab Var	dB (A)	
3	CPCB Limits in dB(A*) Leq (Residential Area)	n Envirol ab Hardon En rdan Envirol ab Vardan	55	- Vardan 145 iroLab Va slab Vardan EnviroLab	dB (A)	
4	CPCB Limits in dB(A*) Leq (Commercial Area)	dan EnviroTalı Varda	65	itab Vard 55 EnviroLa	dB (A)	
5	CPCB Limits in dB(A*) Leq (Silent Zone)	Vardan Envirotah Varu I Tuvitotah Vardan En	ne Envirat at 50 endan En vir et ab Vardan Envirata	Vardan Enviro	dB (A)	

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Test Report

Sample Number : VEL/N/08 Name & Address of the Party

Ws Raipur Energen Limited (Formerly GMR Chhattisgarh Energy Ltd.) Village-Raikheda, Block- Tilda, Dist-Raipur, Chhattisgarh.

Sample Description

 General Information
 :
 Net

 Sampling Location
 :
 Net

 Sample Collected By
 :
 VE

 Sampling Equipment used
 :
 So

 Instrument Code
 :
 VE

 Instrument Calibration Status
 :
 Cal

 Meteorological condition during monitoring
 :
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 Date of Monitoring
 :
 24/

 Time of Monitoring
 :
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 Ambient Temperature (°C)
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 Scope of Monitoring
 :
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 Sampling & Analysis Protocol
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 Sampling Duration
 :
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 Parameter Required
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: AMBIENT NOISE

Near Main Gate No-1 VEL Representative (Mr. Chimman Sound Level Meter VEL/SLM/03 Calibrated Clear Sky 24/03/2023 To 25/03/2023 06:00 AM to 06:00 AM Min.20°C, Max.35.9°C Human & Vehicular Activities Regulatory Requirement CPCB Guidlines & IS:9989 24.0 Hours As per work order

Report No. Format No Party Reference No Reporting Date Period of Analysis Receipt Date ULR No.

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; VEL	N/2303311008
: 7.8 F	-03
: 5703	004128 (21/04/2022)
: 08/0	4/2023
: 03/0	4/2023-08/04/2023
: 31/0	3/2023
: TC6	29923200001296F

S.No.	Parameters dan EnviroLab Va	Test Method	Wit place Variable Test Results Variable Environment		
	wirol.al) Vardas Envirol.al V b Vardas Envirol.al Vardas		Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 6:00 am)	arti En arti Va r dan t
1	LegiroLab Vardan Envirol. U	I S-9989	64.89	54.06	dB (A)
2	CPCB Limits in dB(A*) Leq (Industrial Area)	nviroLab Varilan Émi	75	70	dB (A)
3	CPCB Limits in dB(A*) Leq (Residential Area)	EnviroLab-Vardan En dan EnviroLab Vardar	ete of all the C55 Construction	Wardan (45 Rolab V. Math Vardan Envirota	dB (A)
A.d	CPCB Limits in dB(A*) Leq (Commercial Area)	dan Envirottab Varilar nykol ah Varidao Envi	1 Indent and 65	stab vard\$5, invitota	dB (A)
5	CPCB Limits in dB(A') Leq (Silent Zone)	Envirol ab Vardan fra	50	40	dB (A)

Note-*A "decibel" is a unit in which noise is measured.

***End of Report**



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(Approved By)

Project Name: M/s Raipur Energen Limited (Formerly GMR Chhattisgarh Energy Ltd.), Village- Raikheda, Block- Tilda, District- Raipur, Chhattisgarh

4th Quarterly Environmental Monitoring Report

4.3 Ground Water Sample Quality Analysis:-



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

Ground Water Quality Monitoring Locations

Location Code:-

GW1- Near Phillips Office GW2- Village- Chicholi Hand Pump Water GW3- Village- Gaitara Hand Pump Water GW4- Village- Raikheda Tap Water GW5- Village- Mura Hand Pump Water GW6- Field Hostal Tap Water GW7- Near AAQMS- 1 (Raw Water Area) (Piezometer – 01) GW8- Near Mura Gate (Piezometer – 02) GW9- Near Ash Recovery Water Area (Piezometer – 03) GW10- Near Wagon Tippler (CHP) Area (Piezometer – 04) GW11- Near AAQMS-2 Doosan (Piezometer - 05) GW12- Near Bricks Plant (OWC Area) (Piezometer - 06)

M/s Vardan EnviroLab, Plot No. 82A, Sector-5, IMT Manesar, Gurugram, Haryana - 122051 Page | 32

an EnviroLa

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



Page No. 1/3

Test Report

Sample Number : VEL/W/01 Name & Address of the Party Sample Description Location Sample Collected by Environmental Condition Sampling and Analysis Protocol		ple Number : VEL/W/01 ie & Address of the Party : M/s Raipur Energen Limited (Formerly GMR Chhattisgarh Energy Ltd.) Village-Raikheda, Block- Tilda, Dist-Raipur, Chhattisgarh. uple Description : WATER (Ground Water) ation : Near Phillips Office /Borewell/ Nursery uple Collected by : VEL Representative (Mr. Chimman Lal) ironmental Condition : OK upling and Analysis : IS, APHA & STP,		Report No. Format No Party Reference No Reporting Date Period of Analysis Receipt Date Sampling Date Sampling Quantity Sampling Type		: VEL/W/2303311005 : 7.8 F 03 : 5703004128 (21/04/2022) : 08/04/2023 : 31/03/2023-06/04/2023 : 31/03/2023 : 27/03/2023 : 5.0 Ltrs.+250 ml : Grab : TC629923200001298F	
S.No.	Parameter	relative per	Test Method	Result	Unit	Specific	ation as per
otal otal	rotali Vindan Emi Vindan Emiratali Ivinotali Vardan Er Ih Vardan Emirad	roduale starr Vistolini Pr Vistolini Pr Vistolini Pr do parello p	an Erstnik ab Vardan Loving, mist of strategic Exercit all Va solution therat de Vardan Eaving	 D. Vandon I. dan Enserve Lob Vandon anton Enserve 	di Vir di Vir Ecologia	Acceptable Limit	Permissible Limits
80V	pH (at 25 °C)	rotab Vari Enviranteo	IS:3025 (Part-11)	7.57		6.5-8.5	No relaxation
2	Colour,Max	Vandan ta Winsdah V	1S:3025 (Part-4)	BLQ(LOQ-1.0)	Hazen Unit	5	ab Va 15 a El
3	Turbidity,Max	ap sources.	IS:3025 (Part-10)	BLQ(LOQ-1.0)	NTU	1.000	5
4	Odour	EnviroLab	IS:3025 (Part-5)	Agreeable	in Penri	Agreeable	Agreeable
5	Taste	rol ab Var	IS:3025 (Part-8)	Agreeable	NICOLO	Agreeable	Agreeable
6	Total Hardness (as Ca	CO3),Max	IS:3025 (Part-21)	207.90	mg/L	200	600
7	Calcium (as Ca),Max	ib Vardan	IS:3025 (Part-40)	73.40	mg/L	75	200
8	Total Alkalinity (as Cal	CO3),Max	IS:3025 (Part-23)	192.85	mg/L	200	600
9	Chloride (as Cl),Max	rolah Van	IS:3025 (Part-32)	58.93	mg/L	250	1000
10	Residual Free Chloring	e (RFC),Min	IS 3025 (Part-26)	BLQ(LOQ-0.1 5)	mg/L	0.2	Envirolati V.
11	Cyanide (as CN),Max	totab Vini InviroLub	IS:3025 (P-27)	BLQ(LOQ-0.0 2)	mg/L	0.05	No relaxation
12	Magnesium (as Mg),M	ax	APHA 23rd Edition:, 3500 Mg B,	5.92	mg/L	30	100
13	Total Dissolved Solids	,Max	IS 3025 (Part-16)	324.00	mg/L	500	2000
14	Sulphate (as SO4),Ma	×	IS 3025 (Part-24)	20.11	mg/L	200	400
15	Fluoride (as F),Max	and collaboration.	APHA 4500 F D	0.28	mg/L	1.0	1.5
16	Nitrate (as NO3),Max	Verdan ke virutab Va	APHA 23rd Edition:2017,4500 NO3. B Screening Method / IS: 3025 (P-34) Chromotropic method	8.08	mg/L	45	No relaxation



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Page No. 2/3

Test Report

ample	Number : VEL/W/01	ood an Yarihan Ingérekaia Y	Report No.		: VEL/W/2303	311005
S.No.	Parameter	Test Method	Result	Unit	Specific IS:10	ation as per 500:2012
i dan Em	Erreinsteiten var dass Estertenst also Reitall Mosmitte Erreisser sits March Moretan Erreinst Statute start en Ber				Acceptable Limit	Permissible Limits
17	Anionic Detergents (as MBAS),Max	IS 3025 (Part - 68)	BLQ(LOQ-0.0 5)	mg/L	0.2	1.0
18	Iron,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	1.0	No relaxation
19	Aluminium as Al,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 02)	mg/L	0.03	0.2
20	Boron as B,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	0.011	mg/L	0,5	2,4
21	Zinc,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	0.028	mg/L	5	15
22	Copper,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 02)	mg/L	0.05	1.5
23	Manganese,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	0.1	0.3
24	Selenium as Se,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 01)	mg/L	0.01	No relaxation
25	Arsenic as As,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 05)	mg/L	0.01	No relaxation
26	Barium (as Ba),Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	0.075	mg/L	0.7	No relaxation
27	Mineral Oil,Max	IS:3025 (P-39)	BLQ(LOQ-0.1)	mg/L	1.0	No relaxation
28	Sulphide as H2S	IS:3025 (P-29)	BLQ(LOQ-0.0 2)	mg/L	0.05	No relaxation



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Test Report

S.No.	Parameter	Test Method	Result	Unit	Specification as per IS:10500:2012	
	Losimento hanglarri male etituali Merdiari Erwinal Er	nt als Mardine Envirotats Viedan Europa Vien law Envirotats Mardan Emfro	arolulu Ver sh Vardan	an Divi	Acceptable Limit	Permissible Limits
Micr	obiological Analysis	Jab Wardun Fredericab Varidan Erner	ot ab Vardi	ph Enviro	Call Varcan	Line had all
29	Coliform	APHA, 23rd Edition, 9221B	<1.8	MPN/10 0ml	a Vaciany I	
30	Escherichia coli	APHA, 23rd Edition, 9221F	<1.8	MPN/10 0ml	5 Val-ba E Jan Enviru	tetrol 45 Ve att Vertlan I
31	Faecal Coliform	APHA, 23rd Edition, 9221E	<1.8	MPN/10 0ml	ndan Unve	Lab yarda

BLQ-Below Limit of Qauntification LOQ-Limit of Quantification.

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No. 1/1

S.No. Parameter	Test Method	Result Unit	Specification as per IS:10500:2012
Sampling and Analysis Protocol	: IS, APHA & STP	ndin treinitab v	ol.4). Vardan Envirut n and out microtab Vard
Environmental Condition	: OK an a second of Wandam Provided Jo Ven	for funded at ah Va	day EnviroLah Verder
Sample Collected by	: VEL Representative (Mr. Chimman Lal)	Sampling Type	; Grab
Location	: Near Phillips Office /Borewell/ Nursery	Sampling Quantity	: 5.0 Ltrs.+250 ml
Sample Description	: WATER (Ground Water)	Sampling Date	: 27/03/2023
		Receipt Date	: 31/03/2023
		Period of Analysis	: 31/03/2023-06/04/2023
	Raikheda, Block- Tilda, Dist-Raipur, Chhattisgarh.	Reporting Date	: 08/04/2023
	(Formerly GMR Chhattisgarh Energy Ltd.) Village-	Party Reference No	: 5703004128 (21/04/2022)
Name & Address of the Party	: M/s Raipur Energen Limited	Format No	: 7.8 F 03
Sample Number : VEL/W/01		Report No.	: VEL/W/2303311005/N
			Page No
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Test Report

ocatio Sample Enviror Sampli Protoco	n Collected by mental Condition ng and Analysis ol	: Near Phillips Offi : VEL Represental : OK : IS, APHA & STP	ce /Borewell/ Nursery tive (Mr. Chimman Lal)	Sampling D Sampling C Sampling T	luantity ype	: 5.0 Ltrs.+250 : Grab	mi vicei als Vi ab Vacon Envicui al Lob Vacon
S.No.	Parameter	t mit of an include	Test Method	Result	Unit	Specifica IS:10	ation as per 500:2012
	Varian Counation Virganate Vendan Tr	nation for data		 Vandam Koolené Mardan Koolené Mardan Trivée 	eireite du Vae revira	Acceptable Limit	Permissible Limits
1	Phenolic Compounds C6H5OH),Max	i (as	IS: 3025 (P-43)	BLQ(LOQ-0.0 005)	mg/L	0.001	0.002
2	Ammonia (as total am	monia-NH31	IS 3025 (P.34)	BLO/LOO.0 31	mail		

BLQ-Below Limit of Qauntification LOQ-Limit of Quantification.

***End of Report**

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		10	RG.	TOA	/

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Page No. 1/3

Test Report

Sample	Number : VEL/W/02			Report No.		: VEL/W/2303	311006
Name &	Address of the Party	: M/s Raipur	Energen Limited	Format No		- 7.8 F 03	
		(Formerly (3MR Chhattisgarh Energy Ltd.) Village-	Party Refer	ence No	: 5703004128	(21/04/2022)
		Raikheda,	Block- Tilda, Dist-Raipur, Chhattisgarh.	Reporting	Date	: 08/04/2023	In Ebviros ali v
				Period of A	matysis	: 31/03/2023-0	06/04/2023
Jun E				Receipt Da	to	: 31/03/2023	
Sample	Description	: WATER (O	round Water)	Sampling (Date	; 27/03/2023	
Locatio	n	: Chicholi ha	ind Pump Water	Sampling 0	Quantity	: 5.0 Ltrs.+250	0 ml
Sample	Collected by	: VEL Ropre	sentative (Mr. Chimman Lai)	Sampling 1	Гуре	Grab	
Campli	nmental Condition	: OK	warni ole Vandare Erren biokh vo				
Protoc	ol	: IS, APHA	\$ STP	ULR No.		: TC62992320	00001299F
S.No.	Parameter	tryinat sa	Test Method	Result	Unit	Specific IS:10	ation as per 500:2012
en f	Vardan Ettin oluu virol ap Vardan Fr		one protection contraction and the original day was the protection of the pro- relation Completion day was related by the protection of the protection of the pro-	a har a barran an Di sche Vaerstaar	ali Var Envice	Acceptable Limit	Permissible Limits
1	pH (at 25 *C)	otal Mars	IS:3025 (Part-11)	7,64		6.5-8.5	No relaxation
2	Colour,Max	Victoria	IS:3025 (Part-4)	BLQ(LOQ-1.0)	Hazen	5	ah Vo 15
3	Turbidity,Max	in contan	IS:3025 (Part-10)	BLQ(LOQ-1.0)	NTU	1	5
4	Odour	Photo I ale	IS:3025 (Part-5)	Agreeable	in Percel	Agreeable	Agreeable
5	Taste	not, ett Marti	IS:3025 (Part-8)	Agreeable	1111221.0	Agreeable	Agreeable
6	Total Hardness (as Ca	CO3),Max	IS:3025 (Part-21)	198.00	mg/L	200	600
7	Calcium (as Ca),Max	an vacdari	IS:3025 (Part-40)	65.47	mg/L	75	200
8	Total Alkalinity (as Cal	CO3),Max	IS:3025 (Part-23)	203.00	mg/L	200	600
9	Chloride (as Cl),Max	rol all Var	IS:3025 (Part-32)	61.29	mg/L	250	1000
10	Residual Free Chlorin	e (RFC),Min	IS 3025 (Part-26)	BLQ(LOQ-0.1 5)	mg/L	0.2	Envirotati Va
11	Cyanide (as CN),Max	for the case	IS:3025 (P-27)	BLQ(LOQ-0.0 2)	mg/L	0.05	No relaxation
12	Magnesium (as Mg),M	ах	APHA 23rd Edition:, 3500 Mg B,	8.34	mg/L	30	100
13	Total Dissolved Solids	,Max	IS 3025 (Part-16)	344.00	mg/L	500	2000
14	Sulphate (as SO4),Ma	x	IS 3025 (Part-24)	23.20	mg/L	200	400
15	Fluoride (as F),Max	FIRSH SEAM	APHA 4500 F D	0.26	mg/L	1.0	1.5
16	Nitrate (as NO3),Max	Vendur p	APHA 23rd Edition:2017,4500 NO3. B Screening Method / IS: 3025 (P.34) Chromotropic method	5.28	mg/L	45	No relaxation



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TC-6299

Page No. 2/3

Test Report

ample	Number: VEL/W/02	In president and president and the	Report No.		: VEL/W/2303	311006
S.No.	Parameter	Test Method	Result	Unit	Specific IS:10	ation as per 500:2012
	Envirol. di Vardan Envirol.ab Vardan Polali Vardan Envirol.ab Vardan Vardan Envirol.ab Vardan En				Acceptable Limit	Permissible Limits
17	Anionic Detergents (as MBAS),Max	IS 3025 (Part - 68)	BLQ(LOQ-0.0 5)	mg/L	0.2	1.0
18	Iron,Max at Vardan EnviroLabi	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	0.017	mg/L	1.0	No relaxation
19	Aluminium as Al,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 02)	mg/L	0.03	0.2
20	Boron as B,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	0.030	mg/L	0.5	2.4
21	Zinc,Max and the Line Vierder Er	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	0.045	mg/L	5	15
22	Copper,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 02)	mg/L	0.05	1.5
23	Manganese,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	0.1	0.3
24	Selenium as Se,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 01)	mg/L	0.01	No relaxation
25	Arsenic as As,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 05)	mg/L	0.01	No relaxation
26	Barium (as Ba),Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	0.7	No relaxation
27	Mineral Oil,Max	IS:3025 (P-39)	BLQ(LOQ-0.1)	mg/L	1.0	No relaxation
28	Sulphide as H2S	IS:3025 (P-29)	BLQ(LOQ-0.0 2)	mg/L	0.05	No relaxation



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Test Report

ample	e Number : VEL/W/02	Consequences and Consecutive Parate A	Report N	0.	: VEL/W/2303	311006	
S.No.	Parameter	Test Method	Result	Unit	Specific IS:10	ification as per 3:10500:2012	
	Innorolab Vardan Brein 1976 - Annora Envirola	191 - An Werdlam Konstrol op Vie date for 9 Ver den Emernetisk Varden Fredro	leol ab tro-		Acceptable Limit	Permissible Limits	
Micr	obiological Analysis	Lite Parel in Environ do Vardan Lite	State Verit			Torney and	
29	Coliform	APHA, 23rd Edition, 9221B	<1.8	MPN/10 0ml		-	
30	Escherichia coli	APHA, 23rd Edition, 9221F	<1.8	MPN/10 0ml	la fa n har é Inn Eastitu	terrat en la	
31	Faecal Coliform	APHA, 23rd Edition, 9221E	<1.8	MPN/10 0ml	a dan tanak		

BLQ-Below Limit of Qauntification, LOQ-Limit of Quantification.

***End of Report

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



Specification as per

IS:10500:2012

Permissible

Limits

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Test Report

			Fage No. In
Sample Number : VEL/W/02		Report No.	: VEL/W/2303311006/N
Name & Address of the Party	: M/s Raipur Energen Limited	Format No	: 7.8 F 03
	(Formerly GMR Chhattisgarh Energy Ltd.) Village-	Party Reference No	: 5703004128 (21/04/2022)
	Raikheda, Block-Tilda, Dist-Raipur, Chhattisgarh.	Reporting Date	: 08/04/2023
		Period of Analysis	: 31/03/2023-06/04/2023
(300 Linda Olada Varita e Li		Receipt Date	: 31/03/2023
Sample Description	: WATER (Ground Water)	Sampling Date	: 27/03/2023
Location	: Chicholi hand Pump Water	Sampling Quantity	: 5.0.1 trs. +250 ml
Sample Collected by	: VEL Representative (Mr. Chimman Lal)	Sampling Type	: Grab
Environmental Condition	: OK	ubun Emplicat all Var	den control als Var due r
Sampling and Analysis	· IS ADHA & STD		

Protocol S.No. Parameter Test Method Result Unit Acceptable Limit Phenolic Compounds (as 1 IS: 3025 (P-43) BLQ(LOQ-0.0 mg/L 0.001 C6H5OH),Max 005) 2 Ammonia (as total ammonia-NH3) IS 3025 (P-34) BLQ(LOQ-0.3) mg/L

BLQ-Below Limit of Qauntification,LOQ-Limit of Quantification.

End of Report



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Test Report

							Page No. 1/3
Sample	Number: VEL/W/03			Report No.		; VEL/W/2303	311007
Name 8	Address of the Party	: M/s Raipur	Energen Limited	Format No		: 7.8 F 03	
		(Formerly G	GMR Chhattisgarh Energy Ltd.) Village-	Party Refer	ence No	: 5703004128	(21/04/2022)
		Raikheda, I	Block- Tilda, Dist-Raipur, Chhattisgarh.	Reporting [Date	: 08/04/2023	
				Period of A	natysis	: 31/03/2023-0	05/04/2023
	without any wards of			Receipt Dat	le	: 31/03/2023	
Sample	Description	: WATER (G	round Water)	Sampling D	ate	: 27/03/2023	
Cample	a Collected by	: Gaitara Ha	nd Pump Water	Sampling C	luantity	: 5.0 Ltrs.+250) ml
Enviror	amental Condition	: VEL Repre	sentative (Mr. Chimman Lai)	Sampling T	ype	: Grab	
Samoli	ng and Analysis	I IO ADUA A	CTD				
Protoc	ol	· 10, APTIA 6	OIF m	ULR No.		: TC62992320	00001300F
S.No.	Parameter	ta yingi ab	Test Method	Result	Unit	Specific IS:10	ation as per 500:2012
	Vandus Prosedant		An of all Vignation Property of the Vignation Constraint of Vignation Constraint Statements of the Vignation Constraint Statements of t	dan krivin i dan krivin i Lab Var dat ardan Favia		Acceptable Limit	Permissible Limits
1	pH (at 25 *C)	erun alti Vang Envient site	IS:3025 (Part-11)	7.53	ivirolu n fasci	6.5-8.5	No relaxation
2	Colour,Max	Venieri	IS:3025 (Part-4)	BLQ(LOQ-1.0)	Hazen Unit	5	15
3	Turbidity,Max	the worlden	IS:3025 (Part-10)	BLQ(LOQ-1.0)	NTU	1	5
4	Odour	Lool. Lill	IS:3025 (Part-5)	Agreeable		Agreeable	Agreeable
5	Taste	marked 1 mark	IS:3025 (Part-8)	Agreeable	12/11/201.0	Agreeable	Agreeable
6	Total Hardness (as Ca	CO3),Max	IS:3025 (Part-21)	247.50	mg/L	200	600
7	Calcium (as Ca),Max	1-100220	IS:3025 (Part-40)	61.50	mg/L	75	200
8	Total Alkalinity (as Ca	CO3),Max	IS:3025 (Part-23)	248.67	mg/L	200	600
9	Chloride (as Cl),Max	rotal Yar?	IS:3025 (Part-32)	70.72	mg/L	250	1000
10	Residual Free Chlorin	e (RFC),Min	IS 3025 (Part-26)	BLQ(LOQ-0.1 5)	mg/L	0.2	1
11	Cyanide (as CN),Max	Envirotati	IS:3025 (P-27)	BLQ(LOQ-0.0 2)	virnLa n Envi	0.05	No relaxation
12	Magnesium (as Mg),M	lax	APHA 23rd Edition:, 3500 Mg B,	22.78	mg/L	30	100
13	Total Dissolved Solids	s,Max	IS 3025 (Part-16)	274.00	mg/L	500	2000
14	Sulphate (as SO4),Ma	x	IS 3025 (Part-24)	24.85	mg/L	200	400
15	Fluoride (as F),Max	1 mm (1) (-1	APHA 4500 F D	0.48	mg/L	1.0	1.5
16	Nitrate (as NO3),Max	Verdan pr med intern	APHA 23rd Edition:2017,4500 NO3. B Screening Method / IS: 3025 (P-34) Chromotropic method	5.35	mg/L	45	No relaxation



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

ISO 9001 | ISO 14001 | ISO 45001



Page No. 2/3

Test Report

ample	Number : VEL/W/03		Report No.		: VEL/W/2303	311007
S.No.	Parameter	Test Method	Result	Unit	Specification as per IS:10500:2012	
	androited Vanan Louidial A				Acceptable Limit	Permissible Limits
17	Anionic Detergents (as MBAS),Max	IS 3025 (Part - 68)	BLQ(LOQ-0.0 5)	mg/L	0.2	1.0
18	Iron,Max an Vandar Environtation	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	0.017	mg/L	1.0	No relaxation
19	Aluminium as Al,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 02)	mg/L	0.03	0.2
20	Boron as B,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	0.5	2.4
21	Zinc,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	5	15
22	Copper,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 02)	mg/L	0.05	1.5
23	Manganese,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	0.1	0.3
24	Selenium as Se,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 01)	mg/L	0.01	No relaxation
25	Arsenic as As,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 05)	mg/L	0.01	No relaxation
26	Barium (as Ba),Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	0.7	No relaxation
27	Mineral Oil,Max	IS:3025 (P-39)	BLQ(LOQ-0.1)	mg/L	1.0	No relaxation
28	Sulphide as H2S	IS:3025 (P-29)	BLQ(LOQ-0.0 2)	mg/L	0.05	No relaxation



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Test Report

ampl	e Number : VEL/W/03	on Environment Visionan Environment Vision	Report N	o.	: VEL/W/2303	311007
S.No.	Parameter	Test Method	Result	Unit	Specifica IS:10	ation as per 500:2012
	Coverable Vision President President	or de Lastine Erseiner als Vanders new Nors de Lastin das Virders deserver	di sha are		Acceptable Limit	Permissible Limits
Micr	obiological Analysis	all farm all farder frienden so	Lat Conta	C		Consection 5
29	Coliform	APHA, 23rd Edition, 9221B	<1.8	MPN/10 0ml		-
30	Escherichia coli	APHA, 23rd Edition, 9221F	<1.8	MPN/10 0ml		in vertier (
31	Faecal Coliform	APHA, 23rd Edition, 9221E	<1.8	MPN/10 0ml	f them it toy of a Vicentina to	Lots Variation

BLQ-Below Limit of Qauntification, LOQ-Limit of Quantification.

***End of Report**

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



Page No. 1/1

Test Report

ample Number : VEL/W/03			Report No.		: VEL/W/23033	311007/N	
lame & Address of the Party	: M/s Raipur Energen Limited		Format No	Format No		: 7.8 F 03	
	(Formerly GMR	Chhattisgarh Energy Ltd.) Village-	Party Refer	ence No	; 5703004128 (21/04/2022)		
	Raikheda, Block-Tilda, Dist-Raipur, Chhattisgarh.		Reporting D	Date	: 08/04/2023		
			Period of A	natysis	: 31/03/2023-0	6/04/2023	
			Receipt Dat	e	: 31/03/2023		
Sample Description	: WATER (Ground Water)		Sampling D	Sampling Date		: 27/03/2023	
.ocation : Gaitara Hand Pump Water		Sampling C	Sampling Quantity		: 5.0 Ltrs.+250 ml		
Sample Collected by	: VEL Representative (Mr. Chimman Lal)		Sampling Type		; Grab		
Environmental Condition	: OK	Kim Envicotali Vantan Envicotali Va			Garr Environt		
Sampling and Analysis Protocol	: IS, APHA & STI	P., Invited ab Voltain Corri					
S.No. Parameter	Fowired all Vie	Test Method	Result	Unit	Specification as per IS:10500:2012		
	N Wall Company Constra				Acceptable	Permissible	
on Succession Provident	minar hit y pai		r (Life Varidan		Contra	ATTIVITION TO	
	norest ub V est Su Vanture Ere Instadi Vassan	m zmirol ab Vardan Envirol ab Grot-b Vardan Envirol ab Envirotab Vardan Enviro	r d. fr Vandar Verova Etwin Oli Vardau Z	Linvira ol.ub.V tyleola	e Varda I	ann ann ann an Al ais Marata Ann al ais Marata	
1 Phenolic Compounds C6H5OH),Max	(as	IS: 3025 (P-43)	BLQ(LOQ-0.0 005)	mg/L	0.001	0.002	

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

Test Report



iample Iame 8	mple Number : VEL/W/04 me & Address of the Party : M/s Raipur Energen Limit (Formerly GMR Chhattisg Raikheda, Block- Tilda, D		Energen Limited Forma 3MR Chhattisgarh Energy Ltd.) Village- Block- Tilda, Dist-Raipur, Chhattisgarh. Report Party I		Report No. Format No Party Reference No Reporting Date		Page No. 1/3 311008 (21/04/2022)	
Sample Description Location Sample Collected by Environmental Condition Sampling and Analysis Protocol		: WATER (Ground Water) : Raikheda Tap Water : VEL Representative (Mr. Chimman Lal) : OK : IS, APHA & STP		Receipt Date Sampling Date Sampling Quantity Sampling Type		: 31/03/2023 : 31/03/2023 : 27/03/2023 : 5.0 Ltrs.+250 ml : Grab : TC629923200001301F		
S.No. Parameter		eter Test Method Result		Unit	Specification as per IS:10500:2012			
oLat oLat	Vendare Everinedale Vename T	ren Dentrolado Vacdaer Cavirol I viez Alab Vandare Erwinskom Va I nore Erreinskab Vandaer Ervin	dər Vərdən İlr dən Erivina Alab Vərdər	ab-Van Enviro	Acceptable Limit	Permissible Limits		
1	pH (at 25 °C)	milel Varg	IS:3025 (Part-11)	7.53	ndrota n lava	6.5-8.5	No relaxation	
2	Colour,Max		IS:3025 (Part-4)	BLQ(LOQ-1.0)	Hazen Unit	5	15	
3	Turbidity,Max	ab Verifini	IS:3025 (Part-10)	BLQ(LOQ-1.0)	NTU	10104-0010	5	
4	Odour	Lunuul li	IS:3025 (Part-5)	Agreeable	an Philip	Agreeable	Agreeable	
5	Taste	at all Var	IS:3025 (Part-8)	Agreeable	Witch	Agreeable	Agreeable	
6	Total Hardness (as Cal	CO3),Max	IS:3025 (Part-21)	237.60	mg/L	200	600	
7	Calcium (as Ca),Max	dy Validaes	IS:3025 (Part-40)	65.47	mg/L	75	200	
8	Total Alkalinity (as Cal	CO3),Max	IS:3025 (Part-23)	243.60	mg/L	200	600	
9	Chloride (as Ci),Max	not ab Yor	IS:3025 (Part-32)	68.36	mg/L	250	1000	
10	Residual Free Chlorine	e (RFC),Min	IS 3025 (Part-26)	BLQ(LOQ-0.1 5)	mg/L	0.2	Enviracab Va Lab Verdari I	
11	Cyanide (as CN),Max	nezzale Via (Lowinalyzh	IS:3025 (P-27)	BLQ(LOQ-0.0 2)	mg/L	0.05	No relaxation	
12	Magnesium (as Mg),M	ax	APHA 23rd Edition:, 3500 Mg B,	17.96	mg/L	30	100	
13	Total Dissolved Solids	,Max	IS 3025 (Part-16)	385.00	mg/L	500	2000	
14	Sulphate (as SO4),Ma	x	IS 3025 (Part-24)	25.88	mg/L	200	400	
15	Fluoride (as F),Max	mon allabo	APHA 4500 F D	0.33	mg/L	1.0	1.5	
16	Nitrate (as NO3),Max	9 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	APHA 23rd Edition:2017,4500 NO3. B Screening Method / IS: 3025 (P-34) Chromotropic method	7.63	mg/L	45	No relaxation	



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Test Report

ample Number : VEL/W/04	and Derwin Like (A. Konstaller, J. Lander, S. K. Konstaller, S. Ko	Report N	0.	: VEL/W/2303	311008
S.No. Parameter	Parameter Test Method	Result	Unit	Specification as per IS:10500:2012	
dan Envirol.d. for the Enviro Emirol.ab Vardan Envirol.ab				Acceptable Limit	Permissible Limits
Microbiological Analysis	ab Yardan amine an Yaram Lusa	al and the second		Cele Victori	Enter
29 Coliform	APHA, 23rd Edition, 9221B	<1.8	MPN/10 0ml	s Vandan E	-
30 Escherichia coli	APHA, 23rd Edition, 9221F	<1.8	MPN/10 0ml	o Vo - smili Imi Cheirol	
31 Faecal Coliform	APHA, 23rd Edition, 9221E	<1.8	MPN/10 0ml		ALL Vituality

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BLQ-Below Limit of Qauntification, 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

Page No. 2/3

sample	Number : VEL/W/04	Report No. ; VEL/W/230			311008	
S.No.	Parameter	Test Method	Result	Unit	Specification as per IS:10500:2012	
i Em					Acceptable Limit	Permissible Limits
17	Anionic Detergents (as MBAS),Max	IS 3025 (Part - 68)	BLQ(LOQ-0.0 5)	mg/L	0.2	1.0
18	Iron,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	1.0	No relaxation
19	Aluminium as Al,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 02)	mg/L	0.03	0.2
20	Boron as B,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	0.062	mg/L	0.5	2.4
21	Zinc,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	5	15
22	Copper,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 02)	mg/L	0.05	1.5
23	Manganese,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	0.1	0.3
24	Selenium as Se,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 01)	mg/L	0.01	No relaxation
25	Arsenic as As,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 05)	mg/L	0.01	No relaxation
26	Barium (as Ba),Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	0.7	No relaxation
27	Mineral Oil,Max	IS:3025 (P-39)	BLQ(LOQ-0.1)	mg/L	1.0	No relaxation
28	Sulphide as H2S	IS:3025 (P-29)	BLQ(LOQ-0.0 2)	mg/L	0.05	No relaxation
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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Hr) ISO 9001 | ISO 14001 | ISO 45001

Test Report

S.No. Parameter	Test Method	Result Uni	Specification as per IS:10500:2012
Sampling and Analysis Protocol	: IS, APHA & STP	Lab Vardan Lov adam Ermizotab	rabib Viedan takinut. 6 V Vandar Engradari Vandar
Environmental Condition	3. OK Las EnviroLab Vardan EnviroLab Var		
Sample Collected by	: VEL Representative (Mr. Chimman Lat)	Sampling Type	: Grab
Location	: Raikheda Tap Water	Sampling Quanti	¥ : 5.0 Ltrs.+250 ml
Sample Description	WATER (Ground Water)	Sampling Date	: 27/03/2023
dan Limbolah Wardan I		Receipt Date	: 31/03/2023
		Period of Analysi	s : 31/03/2023-06/04/2023
	Raisneda, Block- rida, Dist-Raiper, Crinausgam.	Reporting Date	: 08/04/2023
	(Formerly GMR Chhattisgarh Energy Ltd.) Village-	Party Reference M	lo : 5703004128 (21/04/2022)
Name & Address of the Party	: M/s Raipur Energen Limited	Format No	: 7.8 F 03
Sample Number : VEL/W/04		Report No.	: VEL/W/2303311008/N
			Page No. 1

	an Envirol ab Vardan Envirol ab V no rot ab Vardan Envirot ab Vardan Lat Vandan Envirot ab Vardan Ere Envirot ab Vardan Envirot ab Vardan Envirot ab Vardan Envirot ab Vardan	Andan Elivinet all Vardan la an Envirot ab Vardan Enviro erot all Vardan Envirot ab v rdan Envirot ab Vardan Env mandah Vardan Envirot a	naireal an Vardan 1 Ar stan Envire In puto Vardan 1	without wirel ah Var breein	IS:10500:2012	
					Acceptable Limit	Permissible Limits
4	Phenolic Compounds (as	IS: 3025 (P-43)	BLQ(LOQ-0.0	mg/L	0.001	0.002
9	C6H5OH),Max	Endtotab Vardan Etwie	005)	WEDL	o Varrian I	

BLQ-Below Limit of Qauntification 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



Page No. 1/3

			Page N
Sample Number : VEL/W/0	5 Manager Constant Statistical and Equilated Lab. Van	Report No.	; VEL/W/2303311009
Name & Address of the Party	: M/s Raipur Energen Limited	Format No	: 7.8 F 03
	(Formerly GMR Chhattisgarh Energy Ltd.) Village-	Party Reference No	; 5703004128 (21/04/2022)
	Raikheda, Block- Tilda, Dist-Raipur, Chhattisgarh.	Reporting Date	: 08/04/2023
		Period of Analysis	: 31/03/2023-06/04/2023
and an an an and a start of the		Receipt Date	; 31/03/2023
Sample Description	: WATER (Ground Water)	Sampling Date	: 27/03/2023
Location	: Mura Hand Pump Water	Sampling Quantity	: 5.0 Ltrs.+250 ml

Test Report

Sample Collected by : VEL Representative (Mr. Chimman Lal) **Environmental Condition** : OK Sampling and Analysis : IS, APHA & STP

Protocol

ULR No.

Sampling Type

: TC629923200001302F

: Grab

S.No.	Parameter	Test Method	Result	Unit	Specification as per IS:10500:2012	
				ab Vari Enviro	Acceptable Limit	Permissible Limits
1	pH (at 25 *C)	(S:3025 (Part-11)	7.63	iviroLa In Lavi	6.5-8.5	No relaxation
2	Colour,Max	IS:3025 (Part-4)	BLQ(LOQ-1.0)	Hazen Unit	5	15
3	Turbidity,Max	IS:3025 (Part-10)	BLQ(LOQ-1.0)	NTU	1	5
4	Odour	IS:3025 (Part-5)	Agreeable	St. Frid	Agreeable	Agreeable
5	Taste	IS:3025 (Part-8)	Agreeable	Whiteleb	Agreeable	Agreeable
6	Total Hardness (as CaCO3),Max	IS:3025 (Part-21)	198.00	mg/L	200	600
7	Calcium (as Ca),Max	IS:3025 (Part-40)	67.45	mg/L	75	200
8	Total Alkalinity (as CaCO3),Max	IS:3025 (Part-23)	203.00	mg/L	200	600
9	Chloride (as Cl),Max	IS:3025 (Part-32)	87.22	mg/L	250	1000
10	Residual Free Chlorine (RFC),Min	IS 3025 (Part-26)	BLQ(LOQ-0.1 5)	mg/L	0.2	1
11	Cyanide (as CN),Max	IS:3025 (P-27)	BLQ(LOQ-0.0 2)	mg/L	0.05	No relaxation
12	Magnesium (as Mg),Max	APHA 23rd Edition:, 3500 Mg B,	7.13	mg/L	30	100
13	Total Dissolved Solids,Max	IS 3025 (Part-16)	407.00	mg/L	500	2000
14	Sulphate (as SO4),Max	IS 3025 (Part-24)	28.98	mg/L	200	400
15	Fluoride (as F),Max	APHA 4500 F D	0.38	mg/L	1.0	1.5
16	Nitrate (as NO3),Max	APHA 23rd Edition:2017,4500 NO3. B Screening Method / IS: 3025 (P-34) Chromotropic method	6.52	mg/L	45	No relaxation



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

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Page No. 2/3

Test Report

ample	Number: VEL/W/05		Report No.		: VEL/W/2303	311009
S.No.	Parameter	Test Method	Result	Unit	Specification as per IS:10500:2012	
	rotal and a second second		True new York		Acceptable Limit	Permissible Limits
17	Anionic Detergents (as MBAS),Max	IS 3025 (Part - 68)	BLQ(LOQ-0.0 5)	mg/L	0.2	1.0
18	Iron,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	1.0	No relaxation
19	Aluminium as Al,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 02)	mg/L	0.03	0.2
20	Boron as B,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	0.5	2.4
21	Zinc,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	0.022	mg/L	5	15
22	Copper,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 02)	mg/L	0.05	1.5
23	Manganese,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	0.1	0.3
24	Selenium as Se,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 01)	mg/L	0.01	No relaxation
25	Arsenic as As,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 05)	mg/L	0.01	No relaxation
26	Barium (as Ba),Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	0.046	mg/L	0.7	No relaxation
27	Mineral Oil,Max	IS:3025 (P-39)	BLQ(LOQ-0.1)	mg/L	1.0	No relaxation
28	Sulphide as H2S	IS:3025 (P-29)	BLQ(LOQ-0.0 2)	mg/L	0.05	No relaxation



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Test Report

	e reminiber : VEL/W/05		Report N	0,	: VEL/W/2303	311009
S.No. Parameter	Parameter Test Method	Result	Unit	Specification as per IS:10500:2012		
			-	Acceptable Limit	Permissible Limits	
Micr	obiological Analysis	an tu un ar martin de Viencus Erren		STATISTICS.	and the date	Engrand
29	Coliform	APHA, 23rd Edition, 9221B	<1.8	MPN/10 0ml		
30	Escherichia coli	APHA, 23rd Edition, 9221F	<1.8	MPN/10 0ml	in Statelais I Ion Fredric	winet. H o Va ab Vandari (
31	Faecal Coliform	APHA, 23rd Edition, 9221E	<1.8	MPN/10 0ml	ruan tanya	alah Varda

BLQ-Below Limit of Qauntification, LOQ-Limit of Quantification.

***End of Report

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- The results reported matter only to the samples listed. In case sample is not drawn the results apply to the sample as receit
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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Hr) ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number : VEL/W/05		Report No.	; VEL/W/2303311009/N
Name & Address of the Party	: M/s Raipur Energen Limited	Format No	: 7.8 F 03
	(Formerly GMR Chhattisgarh Energy Ltd.) Village-	Party Reference No	: 5703004128 (21/04/2022)
	Raikheda, Block- Tilda, Dist-Raipur, Chhattisgarh.	Reporting Date	: 08/04/2023
		Period of Analysis	: 31/03/2023-06/04/2023
		Receipt Date	; 31/03/2023
Sample Description	: WATER (Ground Water)	Sampling Date	: 27/03/2023
Location	: Mura Hand Pump Water	Sampling Quantity	: 5.0 Ltrs.+250 ml
Sample Collected by	: VEL Representative (Mr. Chimman Lal)	Sampling Type	Grab
Environmental Condition	: OK	dart EnviroLab Var	dan Envirolab Verdan fins
Sampling and Analysis Protocol	: IS, APHA & STP		

S.No. Parameter	Parameter	Test Method	Result	Unit	Specification as per IS:10500:2012	
	Varden Freiholten Section felder onet als Weiden Envirolisie Verdin Reverbalt Freiholten Varden, and	Constant of the Version of the Versi	inter dans berefen ofer Long Visedan fredar Erreg	oli Vian Enivira stati V	Acceptable Limit	Permissible Limits
1	Phenolic Compounds (as	IS: 3025 (P-43)	BLQ(LOQ-0.0	mg/L	0.001	0.002
	C6H5OH),Max		005)		and Distanting of	

BLQ-Below Limit of Qauntification LOQ-Limit of Quantification

***End of Report



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Page No. 1/3

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100	110	0011

Sample Number : VEL/W/06 Name & Address of the Party : M/s Raipu (Formerly Raikheda Sample Description : WATER (Location : Field Hos Sample Collected by : VEL Repr		umber : VEL/W/06 uddress of the Party : M/s Raipur Energen Limited (Formerly GMR Chhattisgarh Energy Ltd.) Village- Raikheda, Block- Tilda, Dist-Raipur, Chhattisgarh. Nescription : WATER (Ground Water) : Field Hostel Tap Water		Report No. Format No Party Reference No Reporting Date Period of Analysis Receipt Date Sampling Date Sampling Quantity		: VEL/W/2303311010 : 7.8 F 03 : 5703004128 (21/04/2022) : 08/04/2023 : 31/03/2023-06/04/2023 : 31/03/2023 : 27/03/2023 : 5.0 Ltrs +250 ml	
		: VEL Repre	sentative (Mr. Chimman Lal)	Sampling T	lune	+ 5.0 Ltrs.+250	J ml
Inviro	mental Condition	: OK	wentah Vardan (winu ali Va	Gamping i	The	Grab	
Sampli	ng and Analysis	: IS, APHA 8	STP Control als Validam Covin	ULR No.		; TC62992320	00001303F
S.No.	Parameter	Envirolatio	Test Method	Result	Unit	Specification as per IS:10500:2012	
an L an L	Vacation Erichook at Notorf afte Vacation Er Sie Vacation Eusericat					Acceptable Limit	Permissible Limits
1	pH (at 25 °C)	entals Vais Coving Lab	IS:3025 (Part-11)	7.56	Sylucity 11 201	6.5-8.5	No relaxation
2	Colour,Max	Vandan ta	IS:3025 (Part-4)	BLQ(LOQ-1.0)	Hazen Unit	5	15
3	Turbidity,Max	an the day	IS:3025 (Part-10)	BLQ(LOQ-1.0)	NTU	1	5
4	Odour	Envirolate	IS:3025 (Part-5)	Agreeable		Agreeable	Agreeable
5	Taste	totab yan	IS:3025 (Part-8)	Agreeable	NO COLO	Agreeable	Agreeable
6	Total Hardness (as Cal	CO3),Max	IS:3025 (Part-21)	183.15	mg/L	200	600
7	Calcium (as Ca),Max	ib Vardom	IS:3025 (Part-40)	61.50	mg/L	75	200
8	Total Alkalinity (as Cal	03),Max	IS:3025 (Part-23)	187.77	mg/L	200	600
9	Chloride (as Cl),Max	ralab Vari	IS:3025 (Part-32)	80.15	mg/L	250	1000
10	Residual Free Chlorine	(RFC),Min	IS 3025 (Part-26)	BLQ(LOQ-0.1 5)	mg/L	0.2	1
11	Cyanide (as CN),Max	Envirotati	IS:3025 (P-27)	BLQ(LOQ-0.0 2)	mg/L	0.05	No relaxation
12	Magnesium (as Mg),M	ax	APHA 23rd Edition:, 3500 Mg B,	7.14	mg/L	30	100
13	Total Dissolved Solids	,Max	IS 3025 (Part-16)	341.00	mg/L	500	2000
14	Sulphate (as SO4),Ma	x dati Vari	IS 3025 (Part-24)	19.69	mg/L	200	400
15	Fluoride (as F),Max	Envirogativ	APHA 4500 F D	0.29	mg/L	1.0	1.5
16	Nitrate (as NO3),Max	Vairelan Ep oleosarb Va	APHA 23rd Edition:2017,4500 NO3. B Screening Method / IS: 3025 (P-34) Chromotropic method	7.61	mg/L	45	No relaxation



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Test Report

Page No. 2/3

ample	Number : VEL/W/06	Vin-Sots I *responsed	Report No.		: VEL/W/2303	311010
S.No.	Parameter	Test Method	Result	Unit	Specification as per IS:10500:2012	
			erntals Varr e He Varrian F		Acceptable Limit	Permissible Limits
17	Anionic Detergents (as MBAS),Max	IS 3025 (Part - 68)	BLQ(LOQ-0.0 5)	mg/L	0.2	1.0
18	Iron,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	1.0	No relaxation
19	Aluminium as Al,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 02)	mg/L	0.03	0.2
20	Boron as B,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	0.5	2.4
21	Zinc,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	0.029	mg/L	inn 5 chros	ab va 15 me Envirolati V
22	Copper,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 02)	mg/L	0.05	1.5
23	Manganese,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	0.1	0.3
24	Selenium as Se,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 01)	mg/L	0.01	No relaxation
25	Arsenic as As,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 05)	mg/L	0.01	No relaxation
26	Barium (as Ba),Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	0.049	mg/L	0.7	No relaxation
27	Mineral Oil,Max	IS:3025 (P-39)	BLQ(LOQ-0.1)	mg/L	1.0	No relaxation
28	Sulphide as H2S	IS:3025 (P-29)	BLQ(LOQ-0.0 2)	mg/L	0.05	No relaxation



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S.No.	Parameter	Test Method	Result	Unit	Specification as per IS:10500:2012	
	CONTRACTOR VIEW AND STRATE	Cold, Jo V. and M. Service Control of Product Product, Service Jos Control, U. and Vardan I. Service Science Control and Product Products in Control of Product Pro	Acceptable Limit	Permissible Limits		
Micr	obiological Analysis	IC STUDA ENVIRONMENT OF THE	of the Varia	Linvure	Cap Vardas	Envaolali
29	Coliform	APHA, 23rd Edition, 9221B	<1.8	MPN/10 0ml	o Varitum E ol. ale Varid	WIRDLAD Vie
30	Escherichia coli	APHA, 23rd Edition, 9221F	<1.8	MPN/10 0ml	o Vetdao F Ian Linvicol	Nirotati Va Ab Vardan i
31	Faecal Coliform	APHA, 23rd Edition, 9221E	<1.8	MPN/10 0ml	ndan Envir 5 Yakdum Er	aLati Vandar NinoLati Van
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BLQ-Below Limit of Qauntification, LOQ-Limit of Quantification.

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S.No. Parameter	Test Method	Result Unit	Specification as per
Sampling and Analysis Protocol	: IS, APHA & STP	Cab Vanden Enviro Ander Enviro etab V	il ali Varifini EriviroLab Va Sedan Cheli oLab Vardani
Environmental Condition	: OK instantion last Vacions Fritandarfs Vac		
Sample Collected by	: VEL Representative (Mr. Chimman Lal)	Sampling Type	: Grab
Location	: Field Hostel Tap Water	Sampling Quantity	: 5.0 Ltrs.+250 ml
Sample Description	: WATER (Ground Water)	Sampling Date	: 27/03/2023
nism Emiliad ab Ventais P		Receipt Date	; 31/03/2023
		Period of Analysis	: 31/03/2023-06/04/2023
	Rainieda, Biock- Tiida, Dist-Raipur, Crinadisgam.	Reporting Date	: 08/04/2023
	(Formerly GMR Chhatlisgarh Energy Ltd.) Village-	Party Reference No	; 5703004128 (21/04/2022)
Name & Address of the Party	: M/s Raipur Energen Limited	Format No	: 7.8 F 03
Sample Number : VEL/W/06		Report No.	: VEL/W/2303311010/N
			Page No. 1/1

S.No.	Parameter	Test Method Result	Result	Unit	Specific: IS:10	ation as per 500:2012	
nil al Ini la Sital	Varden Footnatub Vardan Davis Gret Sh Vasden Trivingtali Minis Sh Vardan Envirotub Varden Jai	(1) all Manufact Parallelation for Dispatchers in weighter the left) all Manufacture in a picket			Acceptable Limit	Permissible Limits	
1,000	Phenolic Compounds (as	IS: 3025 (P-43)	BLO/LOO-0.0	mg/L	0.001	0.002	
1	C6H5OH),Max		005)	1000	C VARIANDER		

BLQ-Below Limit of Qauntification,LOQ-Limit of Quantification.

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Test Report

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Sample Number : VEL/W/07 Name & Address of the Party Sample Description Location Sample Collected by Environmental Condition Sampling and Analysis Protocol		nple Number : VEL/W/07 ne & Address of the Party : M/s Raipur Energen Limited (Formerly GMR Chhattisgarh Energy Ltd.) Vilage-Raikheda, Block- Tilda, Dist-Raipur, Chhattisgarh. nple Description : WATER (Piezometer Water Well-01) :ation : Near AAQMS-1 (Raw Water Area nple Collected by : VEL Representative (Mr. Chimman Lal) vironmental Condition : OK mpling and Analysis : IS, APHA & STP,		Report No. Format No Party Reference No Reporting Date Period of Analysis Receipt Date Sampling Date Sampling Quantity Sampling Type		: VELW/2303311011 : 7.8 F 03 : 5703004128 (21/04/2022) : 08/04/2023 : 31/03/2023-06/04/2023 : 31/03/2023 : 27/03/2023 : 5.0 Ltrs.+250 ml : Grab	
rotoc	Parameter	an yardan Irotab yari	Test Method	Result	Unit	Specification as per	
- 11 C	Research Vardan		Verdan Epsereturu Yaudun Lun	a new state of the state	U. Contra	IS:10500:2012	
	Vardan Emirikal Winatab Vardan E ab Vardan Laurat	r dan dan G Marokab V Sia Vendan	Virti ah Vardan Envirol ah Va Virti ah Vardan Envirol ah Va udan Envirot ah Vardan Envirol Envirol ah Vardan Envirol da k	all verification of an United States of all Constant and States Constant and States Constant	and rights and Yair Europee of the V	Acceptable Limit	Permissible Limits
1	pH (at 25 °C)	rol ab Van Emilio ab	IS:3025 (Part-11)	7.59	Wirolu	6.5-8,5	No relaxation
2	Colour,Max	Varilan Pe wirolah V	IS:3025 (Part-4)	BLQ(LOQ-1.0)	Hazen Unit	5	15
3	Turbidity,Max	ab Vardan	IS:3025 (Part-10)	BLQ(LOQ-1.0)	NTU	1	5
4	Odour	Envirol an	IS:3025 (Part-5)	Agreeable	in Bayl	Agreeable	Agreeable
5	Taste	ITOLISIS VAID	IS:3025 (Part-8)	Agreeable	WILDER	Agreeable	Agreeable
6	Total Hardness (as Ca	CO3),Max	IS:3025 (Part-21)	193.05	mg/L	200	600
7	Calcium (as Ca),Max	15 Vantan	IS:3025 (Part-40)	63.48	mg/L	75	200
8	Total Alkalinity (as Cal	CO3),Max	IS:3025 (Part-23)	203.00	mg/L	200	600
9	Chloride (as Cl),Max	rotab Vari	IS:3025 (Part-32)	73.08	mg/L	250	1000
10	Residual Free Chlorin	e (RFC),Min	IS 3025 (Part-26)	BLQ(LOQ-0.1 5)	mg/L	0.2	Envirol no V
11	Cyanido (as CN),Max	Totab Marc	IS:3025 (P-27)	BLQ(LOQ-0.0 2)	mg/L	0.05	No relaxation
12	Magnesium (as Mg),M	ax ardan Er	APHA 23rd Edition:, 3500 Mg B,	8.34	mg/L	30	100
13	Total Dissolved Solids	s,Max	IS 3025 (Part-16)	360.00	mg/L	500	2000
14	Sulphate (as SO4),Ma	x tab vara	IS 3025 (Part-24)	25.99	mg/L	200	400
15	Fluoride (as F),Max	Envirolab	APHA 4500 F D	0.36	mg/L	1.0	1.5
16	Nitrate (as NO3),Max	Vardan Li wixoLab Ve ab Vardan	APHA 23rd Edition:2017,4500 NO3. B Screening Method / IS: 3025 (P-34) Chromotropic method	6.71	mg/L	45	No relaxation



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Test Report

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	7.257	ω.		- -	-	-

ample	Number: VEL/W/07	THE REPORT OF THE AREA	Report No.		: VEL/W/2303	311011
S.No.	Parameter	Test Method	Result	Unit	Specification as per IS:10500:2012	
	tent on constant Longer all Second		 Wester in Marris State the dates 		Acceptable Limit	Permissible Limits
17	Anionic Detergents (as MBAS),Max	IS 3025 (Part - 68)	BLQ(LOQ-0.0 5)	mg/L	0.2	1.0
18	Iron,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	0.016	mg/L	1.0	No relaxation
19	Aluminium as Al,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 02)	mg/L	0.03	0.2
20	Boron as B,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	-0.0 mg/L 0.5		2.4
21	Zinc,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	0.025	mg/L	5	15
22	Copper,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 02)	mg/L	0.05	1.5
23	Manganese,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	0.1	0.3
24	Selenium as Se,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 01)	mg/L	0.01	No relaxation
25	Arsenic as As,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 05)	mg/L	0.01	No relaxation
26	Barium (as Ba),Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	0.021	mg/L	0.7	No relaxation
27	Mineral Oil,Max	IS:3025 (P-39)	BLQ(LOQ-0.1)	mg/L	1.0	No relaxation
28	Sulphide as H2S	IS:3025 (P-29)	BLQ(LOQ-0.0 2)	mg/L	0.05	No relaxation



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Test Report

S.No.	Parameter	Test Method	Result	Unit	Specification as per IS:10500:2012	
	Gentria ado y septembres Millah Virrenti Producto y Virran Epierrel ado ya da	Anti- and the set of a ter	erol. Ab Varia	an tree	Acceptable Limit	Permissible Limits
Micr	obiological Analysis	IT PALLIN CONTROL AND VIOLULE PORT	and vard	A Dente	the Vildan	Envirolab
29	Coliform	APHA, 23rd Edition, 9221B	<1.8	MPN/10 0ml	o Varidan L IoLab Varo	ninolain Va
30	Escherichia coli	APHA, 23rd Edition, 9221F	<1.8	MPN/10 0ml	B Vatalian B Ian Environ	Wied, 25 Va ab Vardon I
31	Faecal Coliform	APHA, 23rd Edition, 9221E	<1.8	MPN/10 0ml	edian Envie s Vardan L	aLab Varda wiroLab Va

BLQ-Below Limit of Qauntification,LOQ-Limit of Quantification,

Depth.Of Water Level :4.06 Mtr.

End of Report

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Page No. 1/1

Test Report

S.No. Parameter	Angel and angel Angel and Angel I Constant of	Test Method	Result	Unit	Specific IS:10	ation as per 500:2012
Environmental Condition Sampling and Analysis	: OK : IS, APHA	& STP				
Sample Collected by	Sample Collected by : VEL Representative (Mr. Chimman Lal)			Туре	: Grab	IVIEW POLS
Location	: Near AAC	MS-1 (Raw Water Area	Sampling	Quantity	: 5 0 L frs +250) ml
Sample Description	: WATER (Piezometer Water Well-01)	Receipt D Sampling	Receipt Date Sampling Date		
		and there of an Wallet Brown	Reporting Period of	Date Analysis	: 08/04/2023 : 31/03/2023-0	6/04/2023
Hand & Address of the Party	(Formerly Raikheda	GMR Chhattisgarh Energy Ltd.) Village- Block- Tilda, Dist-Raipur, Chhattisgarh.	Format No Party Refe	o prence No	: 7.8 F 03 : 5703004128	(21/04/2022)
Sample Number : VEL/W/0 Name & Address of the Party	T Min Dala	- Farmer Halled	Report No		: VEL/W/2303	311011/N

Env	por Vandan Envirol - Marca - Marca	aratkalı Varifart Feodralı Tradrof 95 VarVIII Fra		state V	edan Envèr Vantas E	ot, ab Viertar releat ab Vie
1	Phenolic Compounds (as C6H5OH),Max	IS: 3025 (P-43)	BLQ(LOQ-0.0 005)	mg/L	0.001	0.002
2	Ammonia (as total ammonia-NH3)	IS 3025 (P-34)	BLQ(LOQ-0.3)	mg/L	al Gerdar	Envirotali

BLQ-Below Limit of Qauntification LOQ-Limit of Quantification.

Depth.Of Water Level :4.06 Mtr.

***End of Report**



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Test Report

							Page No. 1/	
ample	Number : VEL/W/08			Report No.		; VEL/W/2303	311012	
lame 8	& Address of the Party	: M/s Raipur	Energen Limited	Format No		: 7.8 F 03		
		(Formerly 0	SMR Chhattisgarh Energy Ltd.) Village-	Party Refer	ence No	: 5703004128	(21/04/2022)	
		Raikheda, I	Block- Tilda, Dist-Raipur, Chhattisgarh.	Reporting I	Date	: 06/04/2023		
				Period of A	nalysis	: 31/03/2023-0	06/04/2023	
tin L	reserved in the second to			Receipt Da	te	: 31/03/2023		
ample	Description	: WATER (P	iezometer -02)	Sampling E	Date	: 27/03/2023		
ocatio	on Collected by	: Near Mura	Gate	Sampling Quantity		: 5.0 Ltrs.+250	lm (
inviro	provide Condition	: VEL Repre	sentative (Mr. Chimman Lai)	Sampling 1	ype	Grab		
amoli	ing and Analysis	: UK	CTD					
Protocol		: 15, APPIA 6	STP	ULR No.		: TC62992320	00001305F	
S.No.	Parameter	i nu lugi ali	Test Method	Result Un		Specific IS:10	ation as per 500:2012	
	Nardan Emilio) di Vardan WiroLab Vardan Emilion da Vardan		VI: otali Vandos Emilia deco emilio Lacienta Vandos Enerel de			Acceptable Limit	Permissible Limits	
1	pH (at 25 °C)	Cob Vien	IS:3025 (Part-11)	7.58		6.5-8.5	No relaxation	
2	Colour,Max	Vardain tu wiretati V	IS:3025 (Part-4)	BLQ(LOQ-1.0)	Hazen Unit	5	15	
3	Turbidity,Max	the second second	IS:3025 (Part-10)	BLQ(LOQ-1.0)	NTU	1	5	
4	Odour	InvitoLab	IS:3025 (Part-5)	Agreeable		Agreeable	Agreeable	
5	Taste	TOURD VAR	IS:3025 (Part-8)	Agreeable	ivite1.4	Agreeable	Agreeable	
6	Total Hardness (as Cal	CO3),Max	IS:3025 (Part-21)	188.10	mg/L	200	600	
7	Calcium (as Ca),Max	AU Vardan	IS:3025 (Part-40)	59.51	mg/L	75	200	
8	Total Alkalinity (as CaC	03),Max	IS:3025 (Part-23)	192.85	mg/L	200	600	
9	Chloride (as Cl),Max	rolau Vari	IS:3025 (Part-32)	87.22	mg/L	250	1000	
10	Residual Free Chlorine	e (RFC),Min	IS 3025 (Part-26)	BLQ(LOQ-0.1 5)	mg/L	0.2	Erwirelab V	
11	Cyanide (as CN),Max	Potab Van Envirotali	IS:3025 (P-27)	BLQ(LOQ-0.0 2)	mg/L	0.05	No relaxation	
12	Magnesium (as Mg),Ma	ax dan li	APHA 23rd Edition:, 3500 Mg B,	9.55	mg/L	30	100	
13	Total Dissolved Solids	,Max	IS 3025 (Part-16)	409.00	mg/L	500	2000	
14	Sulphate (as SO4),Ma	x	IS 3025 (Part-24)	34.34	mg/L	200	400	
15	Fluoride (as F),Max	nva otsb	APHA 4500 F D	0.31	mg/L	1.0	1.5	
16	Nitrate (as NO3),Max	Vardao ko vicetad V b Vardan	APHA 23rd Edition:2017,4500 NO3, B Screening Method / IS: 3025 (P-34) Chromotropic method	6.60	mg/L	45	No relaxation	
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Test Report

ample	e Number : VEL/W/08		Report No.		: VEL/W/2303311012		
S.No.	Parameter	Test Method	Result	Unit	Specification as per IS:10500:2012		
	ral di Vindan Lovra Lili Var		and the same		Acceptable Limit	Permissible Limits	
17	Anionic Detergents (as MBAS),Max	IS 3025 (Part - 68)	BLQ(LOQ-0.0 5)	mg/L	0.2	1.0	
18	Iron,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	1.0	No relaxation	
19	Aluminium as Al,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 02)	mg/L	0.03	0.2	
20	Boron as B,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	0.050	mg/L	0.5	2.4	
21	Zinc,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	5	15	
22	Copper,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 02)	mg/L	0.05	1.5	
23	Manganese,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	0.1	0.3	
24	Selenium as Se,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 01)	mg/L	0.01	No relaxation	
25	Arsenic as As,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 05)	mg/L	0.01	No relaxation	
26	Barium (as Ba),Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	0.7	No relaxation	
27	Mineral Oil,Max	IS:3025 (P-39)	BLQ(LOQ-0.1)	mg/L	1.0	No relaxation	
28	Sulphide as H2S	IS:3025 (P-29)	BLQ(LOQ-0.0 2)	mg/L	0.05	No relaxation	



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C-6299

Test Report

lample	e Number : VEL/W/08		Report N	Page No. : Report No. : VEL/W/2303311012			
S.No.	Parameter	Test Method	Result	Unit	Specification as per IS:10500:2012		
	- investigation of the	The date to be of the best of the second of	n of ada Mari	molecula molecula	Acceptable Limit	Permissible Limits	
Micr	obiological Analysis	the Western English ph Warmon Provi	T all the second	LOVIN	BU Vardan	Ensirolati	
29	Coliform	APHA, 23rd Edition, 9221B	<1.8	MPN/10 0ml	o Vactore E ol alt Vard	Minet all vie	
30	Escherichia coli	APHA, 23rd Edition, 9221F	<1.8	MPN/10 0ml	tan control	ati Vardan L	
31	Faecal Coliform	APHA, 23rd Edition, 9221E	<1.8	MPN/10 0ml	edun Erreit	of ab Vandbill wir of ab Van	

BLQ-Below Limit of Quantification,LOQ-Limit of Quantification

Depth. Of Water Level :5.35 Mtr.

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Page No. 1/1

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

Test Report

Sample Number : VEL/W/	08	3		Report No.		311012/N	
Name & Address of the Party	/ : M/s Raipur I	Energen Limited	Format No		: 7.8 F 03		
	(Formerly G	MR Chhattisgarh Energy Ltd.) Village-	Party Refer	ence No	: 5703004128	(21/04/2022)	
	Raikheda, B	llock- Tilda, Dist-Raipur, Chhattisgarh.	Reporting I	Date	: 08/04/2023		
			Period of A	nalysis	: 31/03/2023-0	6/04/2023	
Sector States and			Receipt Da	to	: 31/03/2023		
Sample Description	: WATER (Pi	ezometer -02)	Sampling D	Date	: 27/03/2023		
Location	: Near Mura (Gate	Sampling (Quantity	: 5 0 Ltrs +250	mi	
Sample Collected by	: VEL Repres	entative (Mr. Chimman Lal)	Sampling 1	(vna	- 0.0 L03200	Charache I	
Environmental Condition	: OK	with the Marshest street at the V	samping (11-0	dan Internial standar		
Sampling and Analysis Protocol	: IS, APHA &	STP					
S.No. Parameter	1	Test Method	Result	Unit	Specification as per IS:10500:2012		
(11.a) Mandant Pain and 100 Kateling and Maralan Crass of Mandan Services			dan basiro Ulan Wirner		Acceptable Limit	Permissible Limits	
Conversion Version Co			In Vacilian e	istrot.	b Varilan I'r	wheelab Vari	
C6H5OH),Max	ds (as	IS: 3025 (P-43)	BLQ(LOQ-0.0 005)	mg/L	0.001	0.002	

BLQ-Below Limit of Quantification,LOQ-Limit of Quantification

Ammonia (as total ammonia-NH3)

Depth. Of Water Level :5.35 Mtr.

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***End of Report

IS 3025 (P-34)

BLQ(LOQ-0.3)

mg/L

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Test Report

							Page No. 1/3
Sample	Number : VEL/W/09			Report No.		; VEL/W/2303	311013
Name &	Address of the Party	: M/s Raipur	Energen Limited	Format No		; 7.8 F 03	
		(Formerly (SMR Chhattisgarh Energy Ltd.) Village-	Party Refer	ence No	: 5703004128	(21/04/2022)
		Raikheda,	Block- Tilda, Dist-Raipur, Chhattisgarh.	Reporting I	Date	: 08/04/2023	
				Period of A	nalysis	: 31/03/2023-0	06/04/2023
Sample Description : W Location : N Sample Collected by : V		miner, above		Receipt Da	te	: 31/03/2023	
		: WATER (P	iezometer -03)	Sampling Date Sampling Quantity		: 27/03/2023	
		: Near Ash F	Recovery Water Area			: 5.0 Ltrs.+250	0 ml
		: VEL Representative (Mr. Chimman Lal)		Sampling 1	ype	: Grab	
Sampli	no and Analysis	IS ADHA	TD				
Protoc	ol 2 Vandaro kanelerek	+ 19, APHA (ULR No.		: TC62992320	00001306F
S.No.	Parameter	Control 25	Test Method	Result	Unit	Specific IS:10	ation as per 500:2012
on Lad	Vardun Enviral sh wirat ab Varian tr sh Vardan Envirou	Vaulan ti reinitali V	when the Vaniter Ecological, Ma Man Department of Discourt Press Invited als was been resident. The		in Via Inning	Acceptable Limit	Permissible Limits
1	pH (at 25 °C)	EnviroLey	IS:3025 (Part-11)	7.57	N POLA	6.5-8.5	No relaxation
2	Colour,Max	Vaniauti	IS:3025 (Part-4)	BLQ(LOQ-1.0)	Hazen Unit	5	15
3	Turbidity,Max	The second second	IS:3025 (Part-10)	BLQ(LOQ-1.0)	NTU	1	5
4	Odour	Cincing Lab	IS:3025 (Part-5)	Agreeable		Agreeable	Agreeable
5	Taste	TO STATIST	IS:3025 (Part-8)	Agreeable	114	Agreeable	Agreeable
6	Total Hardness (as Cat	CO3),Max	IS:3025 (Part-21)	188.10	mg/L	200	600
7	Calcium (as Ca),Max	My Martelans	IS:3025 (Part-40)	71.42	mg/L	75	200
8	Total Alkalinity (as CaC	03),Max	IS:3025 (Part-23)	197.92	mg/L	200	600
9	Chloride (as Cl),Max	rotab You	IS:3025 (Part-32)	73.08	mg/L	250	1000
10	Residual Free Chlorine	(RFC),Min	IS 3025 (Part-26)	BLQ(LOQ-0.1 5)	mg/L	0.2	Enviro ¹ nie Va
11	Cyanide (as CN),Max	otan Var Imrirotab	IS:3025 (P-27)	BLQ(LOQ-0.0 2)	mg/L	0.05	No relaxation
12	Magnesium (as Mg),Ma	ax	APHA 23rd Edition:, 3500 Mg B,	2.32	mg/L	30	100
13	Total Dissolved Solids	,Max	IS 3025 (Part-16)	333.00	mg/L	500	2000
14	Sulphate (as SO4),Max	X	IS 3025 (Part-24)	27.95	mg/L	200	400
15	Fluoride (as F),Max	(IIVICOL als	APHA 4500 F D	0.42	mg/L	1.0	1.5
16	Nitrate (as NO3),Max	Vacour Er Wortsh V.	APHA 23rd Edition:2017,4500 NO3. B Screening Method / IS: 3025 (P-34) Chromotropic method	6.88	mg/L	45	No relaxation



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Page No. 2/3

Test Report

ample	Number: VEL/W/09		Report No.		: VEL/W/2303	311013
S.No.	Parameter	Test Method	Result	Unit	Specification as per IS:10500:2012	
	Promoticale Vandan Eonion, ale naturale Vänden Englandrade Vanda n Mandain Edmond ale Vandan (Edm				Acceptable Limit	Permissible Limits
17	Anionic Detergents (as MBAS),Max	IS 3025 (Part - 68)	BLQ(LOQ-0.0 5)	mg/L	0.2	1.0
18	Iron,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ0.01)	mg/L	1.0	No relaxation
19	Aluminium as Al,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 02)	mg/L	0.03	0.2
20	Boron as B,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	0.065	mg/L	0.5	2.4
21	Zinc,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	5	15
22	Copper,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 02)	mg/L	0.05	1.5
23	Manganese,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	0.1	0.3
24	Selenium as Se,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 01)	mg/L	0.01	No relaxation
25	Arsenic as As,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 05)	mg/L	0.01	No relaxation
26	Barium (as Ba),Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	0.7	No relaxation
27	Mineral Oil,Max	IS:3025 (P-39)	BLQ(LOQ-0.1)	mg/L	1.0	No relaxation
28	Sulphide as H2S	IS:3025 (P-29)	BLQ(LOQ-0.0	mg/L	0.05	No relaxation



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Test Report

ample	Number: VEL/W/09		Report N	Page No. port No. : VELW/2303311013			
S.No.	Parameter	Test Method	Result	Unit	Specification as per IS:10500:2012		
	nut di Verdito Comulario di	Verden Envirulative data verden ter	totalistan Di Verme	Care Care Construction	Acceptable Limit	Permissible Limits	
Micr	obiological Analysis	The second se	A DE VATE	1.114			
29	Coliform	APHA, 23rd Edition, 9221B	<1.8	MPN/10 0ml	o Carbon y	-	
30	Escherichia coli	APHA, 23rd Edition, 9221F	<1.8	MPN/10 0ml	o Vic <u>a</u> naut Ian tinar o		
31	Faecal Coliform	APHA, 23rd Edition, 9221E	<1.8	MPN/10 0ml	e dan Kordi Vardan y	stati Vordar	

BLQ-Below Limit of Qauntification, LOQ-Limit of Quantification.

Depth. Of Water Level: 1.2 Mtr.

'End of Report'



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- To confirm the authenticity of this certificate of analysis, please contact us through ensail at tability sectors on in Laboratory is not responsible for the authenticity of photocopied liest report. The test samples will be retained of
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ample Number : VEL/W/09 Report No. : VEL/W/2033311013/N ame & Address of the Party : M/s Raipur Energen Limited Format No : 7.8 F 03 (Formerty GMR Chhattisgarh Energy Ltd.) Village- Raikheda, Block- Tilda, Dist-Raipur, Chhattisgarh Party Reference No : 5703004128 (21/04/20) sample Description : WATER (Piezometer -03) Receipt Date : 21/03/2023 ocation : Near Ash Recovery Water Area Sampling Date : 27/03/2023 iampling and Analysis : IS, APHA & STP, Sampling Type : Grab rotocool S.No. Parameter Test Method S.No. Parameter Continue Result Unit Specification as prise			Test Report				
ample Number : VEL/W/09 Report No. : VEL/W/2303311013/N amme & Address of the Party : M/s Raipur Energen Limited Formerty GMR Chhattisgarh Energy Ltd.) Vilage- Raikheda, Block- Tilda, Dist-Raipur, Chhattisgarh. Format No : 7.8 F 03 ample Description : WATER (Piezometer -03) Party Reference No : 5/03004128 (21/04/20) ocation : Near Ash Recovery Water Area Sampling Date : 27/03/2023 iample Collected by : VEL Representative (Mr. Chimman Lal) Sampling Type : Grab invironmental Condition : OK Sampling Type : Grab sampling and Analysis : IS, APHA & STP Test Method Result Unit Specification as plis:10500:2012 S.No. Parameter Test Method Result Unit Specification as plis:10500:2012							Page No.
ame & Address of the Party : M/s Raipur Energen Limited (Formerty GMR Chhattisgarh Energy Ltd.) Village- Raikheda, Block- Tilda, Dist-Raipur, Chhattisgarh. Format No : 7.8 F 03 Party Reference No : 5703004128 (21/04/20) Reporting Date : 08/04/2023 Period of Analysis : 31/03/2023-06/04/2023 cample Description : WATER (Piezometer -03) ocation : Near Ash Recovery Water Area ample Collected by : VEL Representative (Mr. Chimman Lal) invironmental Condition : OK iampling and Analysis : IS, APHA & STP rotocol Test Method S.No. Parameter Test Method Result Unit Specification as j IS:10500:2012 IS:10500:2012 Acceptable Permin	mple Number : VEL/W/	9		Report No.		: VEL/W/23033	311013/N
(Formerly GMR Chhattisgarh Energy Ltd.) Vilage- Raikheda, Block- Tilda, Dist-Raipur, Chhattisgarh. Party Reference No : 5703004128 (21/04/20) ample Description : WATER (Piezometer -03) Receipt Date : 31/03/2023-06/04/2023 ocation : Near Ash Recovery Water Area Sampling Date : 27/03/2023 iample Collected by : VEL Representative (Mr. Chimman Lai) Sampling Quantity : 5.0 Ltrs.+250 ml invironmental Condition : OK Sampling Type : Grab sample and Analysis : IS, APHA & STP, Test Method Result Unit Specification as plis: S.No. Parameter Test Method Result Unit Specification as plis: 15:10500:2012	ame & Address of the Party	: M/s Raipur En	ergen Limited	Format No		: 7.8 F 03	
Raikheda, Block- Tilda, Dist-Raipur, Chhattisgarh. Reporting Date : 08/04/2023 Period of Analysis : 31/03/2023-06/04/2023 Receipt Date : 31/03/2023 cation : Near Ash Recovery Water Area Sampling Date : 27/03/2023 ample Collected by : VEL Representative (Mr. Chimman Lal) Sampling Quantity : 5.0 Ltrs.+250 ml nvironmental Condition : OK : IS, APHA & STP, : Grab rotocol : SNo. Parameter Test Method Result Unit Specification as j S.No. Parameter Test Method Result Unit Specification as j 1 : Is:10500:2012		(Formerly GMI	Chhattisgarh Energy Ltd.) Village	Party Refere	ence No	: 5703004128	(21/04/2022)
ample Description : WATER (Piezometer -03) Sampling Date : 31/03/2023-06/04/2023 ocation : Near Ash Recovery Water Area Sampling Date : 27/03/2023 ample Collected by : VEL Representative (Mr. Chimman Lal) Sampling Quantity : 5.0 Ltrs.+250 ml nvironmental Condition : OK : Sampling Type : Grab ampling and Analysis : IS, APHA & STP : Test Method Result Unit Specification as plicity S.No. Parameter Test Method Result Unit Specification as plicity : 10500:2012 Acceptable Limit Unit Specification as plicity : 10500:2012 : 10500:2012		Raikheda, Blor	k- Tilda, Dist-Raipur, Chhattisgarh	Reporting D	Date	: 08/04/2023	n Envirola
ample Description : WATER (Piezometer -03) Sampling Date : 31/03/2023 ocation : Near Ash Recovery Water Area Sampling Date : 27/03/2023 ample Collected by : VEL Representative (Mr. Chimman Lal) Sampling Quantity : 5.0 Ltrs. +250 ml nvironmental Condition : OK Sampling Type : Grab ampling and Analysis : IS, APHA & STP, Test Method Result Unit Specification as plistion as plisting the presence of the pre				Period of A	natysis	: 31/03/2023-0	6/04/2023
ample Description : WATER (Piezometer -03) Sampling Date : 27/03/2023 ocation : Near Ash Recovery Water Area Sampling Quantity : 5.0 Ltrs.+250 ml ample Collected by : VEL Representative (Mr. Chimman Lal) Sampling Type : Grab nvironmental Condition : OK : IS, APHA & STP, Sampling Type : Grab rotocol : IS, APHA & STP, Test Method Result Unit Specification as points: 15:10500:2012 S.No. Parameter Test Method Result Unit Specification as points: 15:10500:2012 Acceptable Permi Limit Limit Limit Limit				Receipt Dat	0	: 31/03/2023	
ocation : Near Ash Recovery Water Area Sampling Quantity : 5.0 Ltrs.+250 ml ample Collected by : VEL Representative (Mr. Chimman Lal) Sampling Type : Grab nvironmental Condition : OK : OK : Grab ampling and Analysis : IS, APHA & STP, : Second ampling Type : Grab rotocol : SNo. Parameter Test Method Result Unit Specification as points S.No. Parameter Iterative (Mr. Chimman Lal) Second ampling Type : Grab	ample Description	: WATER (Piez	ometer -03)	Sampling D	ate	: 27/03/2023	
ample Collected by : VEL Representative (Mr. Chimman Lai) Sampling Type : Grab	ocation	: Near Ash Rec	overy Water Area	Sampling C	uantity	: 5.0 Ltrs.+250	ml
nvironmental Condition : OK ampling and Analysis : IS, APHA & STP rotocol S.No. Parameter Test Method Result Unit Specification as p IS:10500:2012 Acceptable Permi Limit Limit	ample Collected by	: VEL Represen	dative (Mr. Chimman Lal)	Sampling T	ype	Grab	wind an V.
ampling and Analysis : IS, APHA & STP rotocol S.No. Parameter Test Method Result Unit Specification as p IS:10500:2012 Acceptable Permi Limit Limit	nvironmental Condition	: OK		ardan Unvirot.	ab Van	dan Envirot	
S.No. Parameter Test Method Result Unit Specification as 18:10500:2012 Acceptable Limit Limit	ampling and Analysis rotocol	: IS, APHA & S	IP				
Acceptable Limit Permi	S.No. Parameter	the second and the	Test Method	Result	Unit	Specific IS:10	ation as per 500:2012
We of all Variant Environment of You we have only Varday Environment Varday Environment all	nut Martin Education mElectroliale Vanders	la Venition La tra	and de Venders Envirol de Ve dan Kryten), 26 Vander Enviro enveluet, Vierdan Envirolation	ndan Savirol Nati Vindar	nh Vari Enviro Maty V	Acceptable Limit	Permissible Limits
1 Phenolic Compounds (as IS: 3025 (P-43) BLQ[LOQ-0.0 mg/L 0.001 0.0	1 Phenolic Compound	ds (as	IS: 3025 (P-43)	BLQ[LOQ-0.0	mg/L	0.001	0.002
2 Ammonia (as total ammonia-NH3) IS 3025 (P-34) BLQ(LOQ-0.3) mg/L -	2 Ammonia (as total a	mmonia-NH3)	IS 3025 (P-34)	BLQ(LOQ-0.3)	mg/L	and Freedoments	sh Wanden
BLQ-Below Limit of Qauntification,LOQ-Limit of Quantification.	000000000000000000000000000000000000000	fication,LOQ-Limit	of Quantification.	Cale Vardan fin	a in the	Pandan Enviro	etrol de Varia
Depth. Of Water Level: 1.2 Mir.	BLQ-Below Limit of Qaunt	3 8.84-					



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Test Report

							Page No. 1/3	
Sample	Number: VEL/W/10			Report No.		: VEL/W/2303	311014	
Name 8	Address of the Party	: M/s Raipur	Energen Limited	Format No		: 7.8 F 03		
		(Formerly C	3MR Chhatlisgarh Energy Ltd.) Village-	Party Refer	ence No	: 5703004128	(21/04/2022)	
		Raikheda,	Block- Tilda, Dist-Raipur, Chhattisgarh.	Reporting I	Date	: 08/04/2023		
				Period of A	nalysis	: 31/03/2023-0	06/04/2023	
Sample	Description			Receipt Date Sampling Date Sampling Quantity		: 31/03/2023 Environment		
Locatio	Description	: WATER (P	iezometer -04)			: 27/03/2023		
Sample	Collected by	· VEL Denne	entative (Mr. Chimman Lal)			: 5.0 Ltrs.+25	0 ml	
Enviror	nmental Condition	: OK		Sampling 1	ype	: Grab		
Sampli	ng and Analysis	: IS. APHA	STP	ot its Strainin		Labs Wandam	Enviroi no Va	
Protoc	ola Vandan knyingi		Contraction Weighten Enternubation	ULR No.		: TC62992320	00001307F	
S.No.	Parameter		Test Method	Result	Unit	Specific IS:10	ation as per 500:2012	
and a	Yardan Envinitia WitoLab Vardan S sb Vardan Lovron	b Yan (Diry F) Ang) - C (Br (C) Also - C (C)	when a starward contraction of the star of	dan Envirol hLab Vardhi aroth Envir	Jib Var Ensira	Acceptable Limit	Permissible Limits	
1	pH (at 25 °C)		IS:3025 (Part-11)	7.61	noiret.a	6.5-8.5	No relaxation	
2	Colour,Max	an one of the	IS:3025 (Part-4)	BLQ(LOQ-1.0)	Hazen Unit	5 10	15	
3	Turbidity,Max		IS:3025 (Part-10)	BLQ(LOQ-1.0)	NTU	1	5	
4	Odour	- militio	IS:3025 (Part-5)	Agreeable	n lei Vi	Agreeable	Agreeable	
5	Taste	Uper Carrier	IS:3025 (Part-8)	Agreeable	11000	Agreeable	Agreeable	
6	Total Hardness (as Ca	CO3),Max	IS:3025 (Part-21)	178.20	mg/L	200	600	
7	Calcium (as Ca),Max	alle Valles alle	IS:3025 (Part-40)	59.51	mg/L	75	200	
8	Total Alkalinity (as Ca	CO3),Max	IS:3025 (Part-23)	182.70	mg/L	200	600	
9	Chloride (as Cl),Max	10120.540	IS:3025 (Part-32)	54.22	mg/L	250	1000	
10	Residual Free Chlorin	ne (RFC),Min	IS 3025 (Part-26)	BLQ(LOQ-0.1 5)	mg/L	0.2	Errotro Lab-Va Lab Vardan F	
11	Cyanide (as CN),Max		IS:3025 (P-27)	BLQ(LOQ-0.0 2)	mg/L	0.05	No relaxation	
12	Magnesium (as Mg),M	fax	APHA 23rd Edition:, 3500 Mg B,	7.15	mg/L	30	100	
13	Total Dissolved Solid	s,Max	IS 3025 (Part-16)	352.00	mg/L	500	2000	
14	Sulphate (as SO4),M	ax	IS 3025 (Part-24)	27.02	mg/L	200	400	
15	Fluoride (as F),Max	119 13 260	APHA 4500 F D	0.30	mg/L	1.0	1.5	
16	Nitrate (as NO3),Max		APHA 23rd Edition:2017,4500 NO3. B Screening Method / IS: 3025 (P.34) Chromotropic method	5.16	mg/L	45	No relaxation	



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Page No. 2/3

Test Report

ample	Number: VEL/W/10	L/W/10 Report No.			: VEL/W/2303311014		
S.No.	Parameter	Test Method	Result	Unit	Specific IS:10	pecification as per IS:10500:2012	
	Emilio Ling Yazirtan Boning Ling P PULAb Victure Construction Vice In Marchael Coving Ling Vice and Ling				Acceptable Limit	Permissible Limits	
17	Anionic Detergents (as MBAS),Max	IS 3025 (Part - 68)	BLQ(LOQ-0.0 5)	mg/L	0.2	1.0	
18	Iron,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	0.012	mg/L	1.0	No relaxation	
19	Aluminium as Al,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 02)	mg/L	0.03	0.2	
20	Boron as B,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	0.048	mg/L	0,5	2.4	
21	Zinc,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	5	15	
22	Copper,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 02)	mg/L	0.05	1.5	
23	Manganese,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	0.1	0.3	
24	Selenium as Se,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 01)	mg/L	0.01	No relaxation	
25	Arsenic as As,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 05)	mg/L	0.01	No relaxation	
26	Barium (as Ba),Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	0.7	No relaxation	
27	Mineral Oil,Max	IS:3025 (P-39)	BLQ(LOQ-0.1)	mg/L	1.0	No relaxation	
28	Sulphide as H2S	IS:3025 (P-29)	BLQ(LOQ-0.0	mg/L	0.05	No relaxation	



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Page No. 3/3

Test Report

ampl	e Number : VEL/W/10		Report No. : VEL/W/2303311014				
S.No	Parameter	Test Method	Test Method Result U	Unit	Specification as per IS:10500:2012		
	Division of Validam Crivin Callele Vierties Crivin of all	stah Vandan Kovimitah Vindan Kovimi Vindan Empirotah Vardan Empirot		Con Onie Presidente	Acceptable Limit	Permissible Limits	
Micr	robiological Analysis	ab Vardan Envirolab Vardan Eroli	atap Varda	in travin	City Varie on	tonen bl.ch	
29	Coliform	APHA, 23rd Edition, 9221B	<1.8	MPN/10 0ml	o Varian P	wirstafb Var n Entrol a	
30	Escherichia coli	APHA, 23rd Edition, 9221F	<1.8	MPN/10 0ml	tan terrinte	ala yardan I	
31	Faecal coliform	APHA, 23rd Edition, 9221E	<1.8	MPN/10 0ml	eduo Envir 8 viertas E	itali vardul Virolab Va	
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BLQ-Below Limit of Qauntification,LOQ-Limit of Quantification.

Depth. Of Water Level :22.16 Mtr

End of Report

04100 EN Mehamari Sh (Approved By) (Checked Dy. Technical Manager-Micro

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Test Report

							Page No. 1/	
Sample Number : VEL/W/10 Name & Address of the Party Sample Description Location Sample Collected by Environmental Condition Sampling and Analysis Protocol S.No. Parameter		: M/s Raipur En (Formerly GMI Raikheda, Bloc	ergen Limited R Chhattisgarh Energy Ltd.) Villa k- Tilda, Dist-Raipur, Chhattisga ometer -04)	Report No. Format No ge-Party Refer arh.Reporting I Period of A Receipt Da Sampling D	Report No. Format No Party Reference No Reporting Date Period of Analysis Receipt Date Sampling Date		: VEL/W/2303311014/N : 7.8 F 03 : 5703004128 (21/04/2022) : 08/04/2023 : 31/03/2023-06/04/2023 : 31/03/2023 : 27/03/2023	
		: Near Wagon Tippler (CHP) Area : VEL Representative (Mr. Chimman Lal) : OK : IS, APHA & STP Test Method		Sampling C Sampling T Result	Juantity Type Unit	: 5.0 Ltrs.+250 ml : Grab Specification as per		
	Vandon Engeland Vandon Engeland Vandor Vandon og	Man dan ta ah Man dan ta ah Into tah Wand	e nello Lati Vardin, Lovi 74 di Montan Envireù di 19 Lovinet ab Vardim Er 19 di ab Vardan Ereitot	rothia Vandan E Vandan Envirot Windus Vandan Ib Vandan Erwis		Acceptable Limit	Permissible Limits	
1	Phenolic Compounds C6H5OH),Max	(as	IS: 3025 (P-43)	BLQ(LOQ-0.0 005)	mg/L	0.001	0.002	
2	Ammonia (as total amm	nonia-NH3)	IS 3025 (P-34)	BLQ(LOQ-0.3)	mg/L	ab Venton	Envirot sh Ve	

***End of Report

BLQ-Below Limit of Qauntification, LOQ-Limit of Quantification

Depth. Of Water Level :22.16 Mtr



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Page No. 1/3

Test Report

Sample Name &	iample Number : VEL/W/11 Name & Address of the Party : M/s Raipur Energen Limited (Formerly GMR Chhattisgarh Energy Ltd.) Village Raikheda, Block- Tilda, Dist-Raipur, Chhattisgarh			Report No. Format No Party Refer Reporting I Period of A	ence No Date nalysis	: VEL/W/2303 ; 7.8 F 03 ; 5703004128 ; 08/04/2023 ; 31/03/2023-0	311015 (21/04/2022) 06/04/2023
Sample	Description : 1	iption : WATER (Piezometer -05) : AAOMS-2 (Doosan)		Receipt Date		: 37/03/2023	
Locatio	on :/			Sampling C	Juantity	: 21103r2023	solicoLab Vior
Sample Collected by : VEL Represent Environmental Condition : OK Sampling and Analysis : IS, APHA & STI Protocol		EL Representative (Mr. Chimman Lal)		VDe	+ 5.0 Lus.+250	in EnviroLab	
		Condition : OK		oumpring i	100	, Grab	
		STP	ULR No.	ULR No.		: TC629923200001308F	
S.No.	Parameter	2.00	Test Method	Result	Unit	Specific IS:10	ation as per 500:2012
901.00 017 1	Worthin brows a score mindlate variant formation	2011				Acceptable Limit	Permissible Limits
1	pH (at 25 °C)		IS:3025 (Part-11)	7.68	nviral i in izavi	6.5-8.5	No relaxation
2	Colour,Max		IS:3025 (Part-4)	BLQ(LOQ-1.0)	Hazen Unit	5	al. Va. 15
3	Turbidity,Max		IS:3025 (Part-10)	BLQ(LOQ-1.0)	NTU	1	5
4	Odour	di di di bi	IS:3025 (Part-5)	Agreeable	un Brivi	Agreeable	Agreeable
5	Taste	100 Y 100	IS:3025 (Part-8)	Agreeable	wirs].;	Agreeable	Agreeable
6	Total Hardness (as CaCO	3),Max	IS:3025 (Part-21)	193.05	mg/L	200	600
7	Calcium (as Ca),Max	Warre con	IS:3025 (Part-40)	71.42	mg/L	75	200
8	Total Alkalinity (as CaCO3	3),Max	IS:3025 (Part-23)	203.00	mg/L	200	600
9	Chloride (as Cl),Max	Lab Vari	IS:3025 (Part-32)	68.36	mg/L	250	1000
10	Residual Free Chlorine (R	FC),Min	IS 3025 (Part-26)	BLQ(LOQ-0.1 5)	mg/L	0.2	EnviroLab Va
11	Cyanide (as CN),Max	virot ch	IS:3025 (P-27)	BLQ(LOQ-0.0 2)	mg/L	0.05	No relaxation
12	Magnesium (as Mg),Max	rates and	APHA 23rd Edition:, 3500 Mg B,	3.52	mg/L	30	100
13	Total Dissolved Solids,Ma	nx	IS 3025 (Part-16)	320.00	mg/L	500	2000
14	Sulphate (as SO4),Max		IS 3025 (Part-24)	20.73	mg/L	200	400
15	Fluoride (as F),Max	COLOR (APHA 4500 F D	0.35	mg/L	1.0	1.5
16	Nitrate (as NO3),Max		APHA 23rd Edition:2017,4500 NO3. B Screening Method / IS: 3025 (P-34) Chromotropic method	5.59	mg/L	45	No relaxation



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Test Report

ample	Number: VEL/W/11		Report No.		: VEL/W/2303311015		
S.No.	Parameter	Test Method	Result	Unit	Specific IS:10	cation as per 0500:2012	
	Envirol. dk Vandun Envirol.abs rol.ab Vandan Envirol.abs Van Mardan Envirol.ab Vardan Fin				Acceptable Limit	Permissible Limits	
17	Anionic Detergents (as MBAS),Max	IS 3025 (Part - 68)	BLQ(LOQ-0.0 5)	mg/L	0.2	1.0	
18	Iron,Max ab Vandan Envirol.ab	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	1.0	No relaxation	
19	Aluminium as Al,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 02)	mg/L	0.03	0.2	
20	Boron as B,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	0.5	2.4	
21	Zinc,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	0.027	mg/L	5		
22	Copper,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 02)	mg/L	0.05	1.5	
23	Manganese,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	0.1	0.3	
24	Solenium as Se,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 01)	mg/L	0.01	No relaxation	
25	Arsenic as As,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 05)	mg/L	0.01	No relaxation	
26	Barium (as Ba),Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	0.046	mg/L	0.7	No relaxation	
27	Mineral Oil,Max	IS:3025 (P-39)	BLQ(LOQ-0.1)	mg/L	1.0	No relaxation	
28	Sulphide as H2S	IS:3025 (P-29)	BLQ(LOQ-0.0	mg/L	0.05	No relaxation	



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Test Report

S.No. Parameter	Test Method	Result	Unit	specifica	ation as per
share I washed a shart and an Establish	arameter Test method	Result	Unit	IS:10500:2012	
Control ab Vinitia Lievingta				Acceptable Limit	Permissible Limits
Microbiological Analysis	Late Ward, or Reported at the date from	1	1	-	
29 Coliform	APHA, 23rd Edition, 9221B	<1.8	MPN/10 0ml	•	-
30 Escherichia coli	APHA, 23rd Edition, 9221F	<1.8	MPN/10 0ml	b Vaulin I Ian Gwire	
31 Faecal Coliform	APHA, 23rd Edition, 9221F	<1.8	MPN/10 0ml	ndan Erwis Mardon E	incide Voledin Interstatio Va

BLQ-Below Limit of Qauntification, LOQ-Limit of Quantification.

Depth.Of Water Level :13.55 Mtr.

***End of Report

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AYYA Dy. Technical Manager-Micro

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Page No. 1/1

Test Report

Name 8	mple Number: VEL/W/11 ime & Address of the Party : M/s Raipur Energ (Formerty GMR 0 Raikheda, Block-		rgen Limited Chhattisgarh Energy Ltd.) Village k- Tilda, Dist-Raipur, Chhattisgarh	Report No. Format No Party Refer Reporting I Period of A	ence No Date nalysis	: VEL/W/2303. : 7.8 F 03 : 5703004128 : 08/04/2023 : 31/03/2023-0	(21/04/2022) 6/04/2023	
Sample Description Location Sample Collected by Environmental Condition Sampling and Analysis Protocol		: WATER (Plezometer -05) : AAQMS-2 (Doosan) : VEL Representative (Mr. Chimman Lal) : OK : IS, APHA & STP,		Receipt Dat Sampling D Sampling C Sampling T	Receipt Date Sampling Date Sampling Quantity Sampling Type		: 31/03/2023 : 27/03/2023 : 5.0 Ltrs.+250 ml : Grab	
S.No. Parameter		Test Method						
5.NO.	Parameter	InvicoLub An	Test Method	Result	Unit	Specifica IS:10	ation as per 500:2012	
5.NO.	Parameter	Envirol de An Notal Van en Vantan Envir Hernelde Van	Test Method	Result	Unit	Specifica IS:10 Acceptable Limit	ation as per 500:2012 Permissible Limits	
3.NO.	Phenolic Compounds C6H5OH),Max	(as	Test Method IS: 3025 (P-43)	Result BLQ(LOQ-0.0 005)	Unit mg/L	Specifica IS:10 Acceptable Limit	ation as per 500:2012 Permissible Limits 0.002	

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Depth.Of Water Level :13.55 Mtr.



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Test Report

							Page No. 1	
ample	Number : VEL/W/12			Report No.		: VEL/W/2303	311016	
ame ð	& Address of the Party	: M/s Raipur	Energen Limited	Format No		: 7.8 F 03		
		(Formerty G	MR Chhattisgarh Energy Ltd.) Village-	Party Refer	ence No	: 5703004128	(21/04/2022)	
		Raikheda, I	Block- Tilda, Dist-Raipur, Chhattisgarh.	Reporting Date		: 08/04/2023		
				Period of A	nalysis	; 31/03/2023-0	6/04/2023	
SHE	refereitige vinnel en Er			Receipt Date Sampling Date Sampling Quantity		: 31/03/2023		
ample	e Description	: WATER (P	ezometer -06)			: 27/03/2023		
ocatio	on Collected by	: Near Bricks	Plant (OWC Area)			: 5.0 Ltrs.+250) ml	
nviro	nmental Condition	Condition : OK		Sampling T	ype	: Grab		
ampli	ing and Analysis	IS ADUA 8	erp					
rotoc	ol	• 15, APHA 6	EnviroLab Vardan EnviroLab	ULR No.	oLati V	: TC62992320	0001309F	
S.No.	Parameter	roi ab Vari Em-ruï ab	Test Method	Result	Unit	Specific IS:10	Specification as per IS:10500:2012	
	entab vasami biologitab vas		hii) Emili otab Vardan Envirol	ab Vardan B		Acceptable	Permissible	
	WinsLife Version D		ndrot Ab Vandan Envirut, ib Va Indan EnviroLab Vandan Envir	Lan Lawire		Limit	Limits	
1	pH (at 25 °C)	cel ali Vare Envirot ali	IS:3025 (Part-11)	7.41	Iviced.a	6.5-8.5	No relaxation	
2	Colour Max	THE PARTY OF	15:3025 (Part-4)	81.0/1.00-1.0)	Hazen	5	15	
201			relate Control als Vander Deut	Braicoa 10/	Unit	lan Conieda Late Van Jar	nto matassan a	
3	Turbidity,Max	18 Yandam	IS:3025 (Part-10)	BLQ(LOQ-1.0)	NTU	od rationshi	5	
4	Odour	Covinaliate	IS:3025 (Part-5)	Agreeable	m Lau	Agreeable	Agreeable	
5	Taste	rol alt Vari	IS:3025 (Part-8)	Agreeable	No.	Agreeable	Agreeable	
6	Total Hardness (as Ca	CO3),Max	IS:3025 (Part-21)	212.85	mg/L	200	600	
7	Calcium (as Ca),Max	ub Vandan	IS:3025 (Part-40)	71.42	mg/L	75	200	
8	Total Alkalinity (as Ca	CO3),Max	IS:3025 (Part-23)	213.15	mg/L	200	600	
9	Chloride (as CI),Max	i oʻtab Vari	IS:3025 (Part-32)	73.08	mg/L	250	1000	
10	Residual Free Chlorin	e (RFC),Min	IS 3025 (Part-26)	BLQ(LOQ-0.1 5)	mg/L	0.2	all variant	
11	Cyanide (as CN),Max	natati Vard I mirotati	IS:3025 (P-27)	BLQ(LOQ-0.0 2)	mg/L	0.05	No relaxation	
12	Magnesium (as Mg),M	ax	APHA 23rd Edition:, 3500 Mg B,	8.33	mg/L	30	100	
13	Total Dissolved Solids	s,Max	IS 3025 (Part-16)	368.00	mg/L	500	2000	
14	Sulphate (as SO4),Ma	IX	IS 3025 (Part-24)	27.33	mg/L	200	400	
15	Fluoride (as F),Max	t ny kal ab	APHA 4500 F D	0.29	mg/L	1.0	1.5	
16	Nitrate (as NO3),Max	Vardan La	APHA 23rd Edition:2017,4500 NO3. B Screening Method / IS: 3025 (P-34) Chromotropic method	6.06	mg/L	45	No relaxatio	



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Test Report

ample	Number : VEL/W/12		Report No.		: VEL/W/2303	311016
S.No.	Parameter	Test Method	Result	Unit	Specific IS:10	ation as per 500:2012
	Envirol. No dan Envirol. Polah Vardan Kashadari Iga I. Vardan Costal abasedari Iga I.		de Oficie Verrit Ethnese dans a		Acceptable Limit	Permissible Limits
17	Anionic Detergents (as MBAS),Max	IS 3025 (Part - 68)	BLQ(LOQ-0.0 5)	mg/L	0.2	1.0
18	Iron,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	0.014	mg/L	1.0	No relaxation
19	Aluminium as Al,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 02)	mg/L	0.03	0.2
20	Boron as B,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	0.042	mg/L	0.5	2.4
21	Zinc,Max English Contained	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	5	ab va 15
22	Copper,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 02)	mg/L	0.05	1.5
23	Manganese,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	0.1	0.3
24	Selenium as Se,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 01)	mg/L	0.01	No relaxation
25	Arsenic as As,Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 05)	mg/L	0.01	No relaxation
26	Barium (as Ba),Max	VEL/STP/ICP/W-01,Issue No-01,Issue Date-01/11/2021	BLQ(LOQ-0.0 1)	mg/L	0.7	No relaxation
27	Mineral Oil,Max	IS:3025 (P-39)	BLQ(LOQ-0.1)	mg/L	1.0	No relaxation
28	Sulphide as H2S	IS:3025 (P-29)	BLQ(LOQ-0.0 2)	mg/L	0.05	No relaxation



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

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Test Report

ampl	e Number : VEL/W/12		Report No. ; VEL/W/2303311016				
S.No.	Parameter Test Method	Test Method	Result	Unit	Specification as per IS:10500:2012		
			1.1.1	Acceptable Limit	Permissible Limits		
Micr	obiological Analysis	at Version Increation Stream				1	
29	Coliform	APHA, 23rd Edition, 9221B	<1.8	MPN/10 0ml			
30	Escherichia coli	APHA, 23rd Edition, 9221F	<1.8	MPN/10 0ml	n Vicelan I Kart Karyleta	nde værden 1	
31	Faecal Coliform	APHA, 23rd Edition, 9221E	<1.8	MPN/10 0ml	enian Drivie Wardare P	SCON VIENO	

BLQ-Below Limit of Qauntification,LOQ-Limit of Quantification.

Depth Of Water Level Meter:9.77 Mtr

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			Test Report				
							Page No. 1/
iample lame 8 Sample Locatio Sample Enviror Sampli	Number : VEL/W/12 Address of the Party Description in Collected by imental Condition ing and Analysis	: M/s Raipur En (Formerly GM Raikheda, Blo : WATER (Piez : Near Bricks P : VEL Represer : OK : IS, APHA & S	ergen Limited R Chhattisgarh Energy Ltd.) Village- ck- Tilda, Dist-Raipur, Chhattisgarh. cometer -06) lant (OWC Area) ntative (Mr. Chimman Lal)	Report No. Format No Party Refer Reporting D Period of A Receipt Dat Sampling D Sampling T	ence No Date nalysis le Nate Quantity Yype	: VEL/W/23033 : 7.8 F 03 : 5703004128 : 08/04/2023 : 31/03/2023-0 : 31/03/2023 : 27/03/2023 : 5.0 Ltrs.+250 : Grab	311016/N (21/04/2022) 6/04/2023
S.No.	Parameter	Test Method	Result	Unit	Specification as per		
	rotab Vardan Endrough V Mandan Endred alle Vardan Matal alt Xaedan Enversion				out Envirocati Marden Envirol Ivinut de Verder Envirol de Ve	Acceptable Limit	Permissible Limits
1	Phenolic Compounds	(as	IS: 3025 (P-43)	BLQ(LOQ-0.0 005)	mg/L	0.001	0.002
Phy	(ConsOn),Max						

Depth Of Water Level Meter:9.77 Mtr

End of Report



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Project Name: M/s Raipur Energen Limited (Formerly GMR Chhattisgarh Energy Ltd.), Village- Raikheda, Block- Tilda, District- Raipur, Chhattisgarh

4th Quarterly Environmental Monitoring Report

4.4 Surface Water Sample Quality Analysis:-



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

Surface Water Quality Monitoring Locations

Location Code:-

- SW1- Chicholi Pond Water
- SW2- Gaitara Pond Water
- SW3- Raikheda Pond Water
- SW4- Bangoli Dam
- SW5- Mura Pond Water

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						Page No. 1
ample I	Number : VEL/SW/	01		Report No.	: VEL/SW/2303311	1001
lame & Address of the Party ;		 W/s Raipur Energen L (Formerly GMR Chhat Raikheda, Block- Tilda 	Ws Raipur Energen Limited (Formerly GMR Chhattisgarh Energy Ltd.) Village- Raikheda, Block- Tilda, Dist-Raipur, Chhattisgarh.		: 7.8 F-03 No : 5703004128 (21/ : 08/04/2023	04/2022)
				Period of Analysi	is : 31/03/2023-04/04	/2023
ample l	Description	: Surface Water		Receipt Date Sampling Date Sampling Quanti	: 31/03/2023 : 27/03/2023	
ample (Collected By	: VEL Representative (Mr. Chimman Lal)	Sampling Type	Grab	
amplin	g and Analysis	: ОК : IS : 3025 & АРНА		ULR No. : TC629923200001		1281F
S.No.	Test Parameters	icol ab Vantan Emi b Vardan Envirol ab	Test Metho	d Vardan Enviro fan Envirot ab	Results	Units
1	pH (at 25°C)	nvinitab Vardan En ob Vardan Enviroto froLio Vardin Envi	IS:3025 (P-1	Lab Vardan Envirol. Indan Envirol. In Cardan Enviro	7.61	orolado V o Vardari Stati 4200
2	Turbidity	Envirol all vareau	IS:3025 (P-1	0)	5.30	NTU
3	Colour	b Yardan Emiliatab	IS: 3025 (P-	4)	BLQ(LOQ-1.0)	Hazen
4	Odour	nelcoLab Vardum En	IS: 3025 (P-	5)	Agreeable	Tretain V
5	Total Hardness as Ca	CO3	IS:3025 (P-2	1) and an Enviro	163,35	mg/L
6	Chloride as Cl	EnviroLith Vardam	IS:3025 (P-3	2) 20 20 20 20 20 20 20 20 20 20 20 20 20	87.22	mg/L
7	Dissolved Oxygen	b Vaccion Povinci ab	IS:3025 (P-3	8) the local ab	6.20	mg/L
8	Cyanide as CN	nv)coLab Vardim Eo	IS:3025 (P-2	27) 6 Vardan Erre	BLQ(LOQ-0.02)	mg/L
9	Total Dissolved Solid	is the Vardan Envir	IS:3025 (P-1	16)	324.00	mg/L
10	Sulphate (as SO4)	EnviroCab Vardan	IS:3025 (P-2	24) Bb Vardan Er	22.17	mg/L
11	Fluoride (as F)	b Vatdan Loonel als	APHA, 4500 F I	B & D	0.37	mg/L
12	Chemical Oxygen De	mand that Vardan En	Fround Vend IS:3025 (P-58) Varday En		49.00 m Em	mg/L
13	Biological Oxygen De	emand	IS 3025 (Part	-44)	11.00	mg/L
14	Lead of the Vardam Of all Vardam Env	VEL/STP/ICP/W-01, Issue 01/11/202		No. 01, Issue date 1	BLQ(LOQ-0.002)	mg/L
15	Selenium	o varaan Envirotais norotais Vardao En als Vardao Envirota	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021		BLQ(LOQ-0.001)	mg/L
16	Iron D Vandato Env	Potab Varitan Envi Envirutate Varitan I	VEL/STP/ICP/W-01, Issue No. 01, I 01/11/2021		BLQ(LOQ-0.01)	mg/L
17	Arsenic as As	h Vardari Envirotab Hylralah Vardas En	VEL/STP/ICP/W-01, Issue I 01/11/202	No. 01, Issue date	BLQ(LOQ-0.005)	mg/L
18	Oil & Grease	ah Vardao Erivirni a	IS:3025 (P-3	39)	0.60	mg/L



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Page No. 2/2

Test Report

ample	Number: VEL/SW/01	Report No.	: VEL/SW/2303311	V/2303311001			
S.No.	Test Parameters	Test Method	Results	Units mg/L			
19	Total Chromium	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	BLQ(LOQ-0.002)				
20	Phenolic Compounds	IS:3025 Part-43	BLQ(LOQ-0.0005)	mg/L			
21	Anionic Detergent as MBAS	IS:3025 Part- 68	BLQ(LOQ-0.05)	mg/L			
22	Zinc	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021		mg/L			
23	Copper	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	BLQ(LOQ-0.002)	mg/L			
24	Cadmium	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	BLQ(LOQ-0.002)	mg/L			
25	Calcium as Ca	IS: 3025 (P-40)	47.61	mg/L			
26	Total Alkalinity as CaCO3	IS:3025 (P-23)	131.95	mg/L			
27	Magnesium as Mg	agnesium as Mg APHA, 3500 Mg B, Calculation Method		mg/L			
28	Aluminium	WEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021		mg/L			
29	Boron	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	0.085	mg/L			
30	Manganese as Mn	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021		mg/L			
31	Mercury (as Hg)	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	BLQ(LOQ-0.0005)	mg/L			

End of Report

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Page No. 1/1

Test Report

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: IS : 3025 & APHA			
: OK all control to view all the fair bound	alab Varilien Frivier	Lilli Vartlan Ere	
: VEL Representative (Mr. Chimman Lal)	Sampling Type	: Grab	
: Chicholi Pond Water	Sampling Quantity	: 31/03/2023 : 27/03/2023 : 5.0 Ltrs.	
: Surface Water	Samolino Date		
	Receipt Date		
	Period of Analysis	: 31/03/2023-04/04	1/2023
raikineda, biock- nida, bist-Raipur, Crinatusgam,	Reporting Date	: 08/04/2023	
(Formerly GMR Chhattisgarh Energy Ltd.) Village- Raikhada, Block, Tilda, Diet Palana, Chhattisaad	Party Reference No	: 5703004128 (21/	04/2022)
: M/s Raipur Energen Limited	Format No	: 7.8 F-03	
и	Report No.	: VEL/SW/230331	1001/N
	 M's Raipur Energen Limited (Formerly GMR Chhattisgarh Energy Ltd.) Village- Raikheda, Block- Tilda, Dist-Raipur, Chhattisgarh. Surface Water Chicholi Pond Water VEL Representative (Mr. Chimman Lal) OK IS : 3025 & APHA 	M Report No. M's Raipur Energen Limited (Formerly GMR Chhattisgarh Energy Ltd.) Village- Raikheda, Block- Tilda, Dist-Raipur, Chhattisgarh. Reporting Date Period of Analysis Receipt Date Sampling Date Sampling Date Sampling Quantity VEL Representative (Mr. Chimman Lal) VEL Representative (Mr. Chimman Lal) Sampling Type	M Report No. : VEL/SW/230331 Format No : 7.8 F-03 Party Reference No : 5703004128 (21/ Reporting Date : 08/04/2023 Period of Analysis : 31/03/2023-04/04 Receipt Date : 31/03/2023-04/04 Receipt Date : 31/03/2023 Sampling Date : 27/03/2023 Sampling Date : 27/03/2023 Sampling Date : 5.0 Ltrs. Sampling Type : Grab

	Test Method	Results	Units
1 Residual Free Chlorine	IS :3025 (P-26)	BLQ(LOQ-0.15)	mg/L
2 Nitrate as NO3	IS:3025 (P - 34)	8.72	mg/L

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Test Report

						Page No. 1
Sample Number : VEL/SW/02			Report No.	; VEL/SW/2303311	1002	
Name & Address of the Party : M/s Raipur Er		: M/s Raipur Energen L	imited	Format No	: 7.8 F-03	
		(Formerly GMR Chhat	tisgarh Energy Ltd.) Village-	Party Reference	No : 5703004128 (21/	04/2022)
		Raikheda, Block- Tilda	i, Dist-Raipur, Chhatlisgarh.	Reporting Date	: 08/04/2023	
				Period of Analysi	s : 31/03/2023-04/04	/2023
Camala F	Desertation	in Vinter Lennie		Receipt Date	: 31/03/2023	
sample L	Description	: Surface Water		Sampling Date	: 27/03/2023	
location	Collected By	: Gaitara Pond Water	Sampling Quantit		ty : 5.0 Ltrs.	
Environn	mental Condition	: VEL Representative (wr. Chimman Larj	Sampling Type	: Grab	
Sampline	g and Analysis	LIC - SOSE & ADUA			1 TOE2002220000	10000
Protocol	otab Vindae I.e.	. 10. 0020 0.00 104	colling Yandan Envirolar	ULK NO.	• 1062992320000	12025
S.No. T	Test Parameters	Envirolate Vaciation	Test Metho	dollah Valatan Is	Results	Units
vitel			Vieldan Envirotali Van	liar Dyein, Cale	antan EtwinoLatz	ALAN VIN
1 p	oH (at 25°C)	ByiroLap Vardan Le	IS:3025 (P-1	1)	7.74	11000
2 1	Furbidity	Envirolab Virdan	IS:3025 (P-1	0)	7.20	NTU
3 0	Colour	Instato Vanden Ente	1S: 3025 (P-	4)	BLQ(LOQ-1.0)	Hazen
4 0	Odour	neight sh touring Pr	IS: 3025 (P-	5)	Agreeable	-
5 1	Total Hardness as Ca	CO3	IS:3025 (P-2	10	128.70	ma/L
6 0	Chloride as Cl	Envirol ab Vardan	IS:3025 (P-3	(2)	77.79	ma/L
7 1	Dissolved Oxygen	Wotab Varilan Ernit	IS:3025 (P-3	(8)	5.80	ma/L
8 0	Cyanide as CN	maleral als Versiliar En	IS:3025 (P-2	(7)	BLQ(LOQ-0.02)	mg/L
9 1	Total Dissolved Solid	s b Vandad Erivirola	IS:3025 (P-1	6)	256.00	mg/L
10 5	Sulphate (as SO4)	Folial Vardan Eine	IS:3025 (P-2	(4)	24.13	mg/L
11	Fluoride (as F)	IroLab Vardan End	APHA, 4500 F I	8&D	0.38	mg/L
12 (Chemical Oxygen Der	mand	IS:3025 (P-5	(8)	57.17	mg/L
13 8	Biological Oxygen De	mand	IS 3025 (Part-44)		2.30	mg/L
14 1	Lead of all varidon EnviroLab Vandum (VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021		BLQ(LOQ-0.002)	mg/L
15 5	5 Selenium		VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021		BLQ(LOQ-0.001)	mg/L
16 1	Iron - Vacitate Lete	irotab Vardan Envia Envirotab Vardan I	VEL/STP/ICP/W-01, Issue I 01/11/202	No. 01, Issue date 1	BLQ(LOQ-0.01)	mg/L
17	Arsenic as As	Varian Envirot -h	VEL/STP/ICP/W-01, Issue 1 01/11/202	No. 01, Issue date 1	BLQ(LOQ-0.005)	mg/L
18	Oil & Grease	ab Vardan Emirola	IS:3025 (P-	39)	0.60	mg/L
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Test Report

Page No. 2/2

sample Number : VEL/SW/02		Report No.	Report No. : VEL/SW/2303311002			
S.No.	Test Parameters	Test Method	Results	Units		
19	Total Chromium	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	BLQ(LOQ-0.002)	mg/L		
20	Phenolic Compounds	IS:3025 Part-43	BLQ(LOQ-0.0005)	mg/L		
21	Anionic Detergent as MBAS	IS:3025 Part- 68	BLQ(LOQ-0.05)	mg/L		
22	Zinc	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	BLQ(LOQ-0.01)	mg/L		
23	Copper	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	BLQ(LOQ-0.002)	mg/L		
24	Cadmium	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	BLQ(LOQ-0.002)	mg/L		
25	Calcium as Ca IS: 3025 (P-40) Total Alkalinity as CaCO3 IS:3025 (P-23) Magnesium as Mg APHA, 3500 Mg B, Calculation Method Aluminium VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021		47.61	mg/L		
26			131.95	mg/L		
27			2.35 2.35	mg/L		
28			BLQ(LOQ-0.002)	mg/L		
29	Boron	Boron VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021		mg/L		
30	Manganese as Mn	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	BLQ(LOQ-0.01)	mg/L		
31	Mercury (as Hg)	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	BLQ(LOQ-0.0005)	mg/L		

BLQ-Below Limit of Quantification LOQ-Limit of Quantification

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BLQ(LOQ-0.15)

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Page No 1/1

mg/L

mg/L

Test Report

S.No. Test Parameters	Envirol of the California network ab	Test Method	t sh Vindan brivi Vaodan Erivit ol a	Results	Units
Sampling and Analysis Protocol	: IS : 3025 & APHA	CiveRouth Var-	tan Envirotab V. Vacdim EnviroLa	indon EnviroLa 5 Vanitao Envir	ib Vander adath Va
Environmental Condition	: ок				
ample Collected By	: VEL Representative (Mr. Chimman	Lal)	Sampling Type	: Grab	
ocation	: Gaitara Pond Water		Sampling Quantity	: 5.0 Ltrs.	
ample Description	: Surface Water		Sampling Date	te : 31/03/2023	
			Receipt Date		
			Period of Analysis	: 31/03/2023-04/0	4/2023
	Raikneda, Biock- Tilda, Dist-Raipur	, Chnattisgam.	Reporting Date	: 08/04/2023	
	(Formerly GMR Chhattisgarh Energy	y Ltd.) Village-	Party Reference No	: 5703004128 (21)	04/2022)
ame & Address of the Party	: M/s Raipur Energen Limited		Format No	; 7.8 F-03	
mple Number : VEL/SW/	12		Report No.	: VEL/SW/230331	1002/N
5				to carrie to the end of the state of the state	a state of the state of the

BLQ-Below Limit of Quantification,LOQ-Limit of Quantification

Residual Free Chlorine

Nitrate as NO3

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End of Report

IS :3025 (P-26)

IS:3025 (P - 34)



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Page No. 1/2

Test Report

Sample Number : VEL/SW/03			Report No.	: VEL/SW/2303311	003	
Name & Address of the Party : M/s Raipur Energen L (Formerly GMR Chhai Raikheda, Block- Tilda		imited tisgarh Energy Ltd.) Village- a, Dist-Raipur, Chhattisgarh.	Format No Party Reference I Reporting Date	; 7.8 F-03 No : 5703004128 (21/ ; 08/04/2023	04/2022)	
Sample Description : Surface Water Location : Raikheda Pond Water Sample Collected By : VEL Representative (Environmental Condition : OK Sampling and Analysis : IS : 3025 & APHA Protocol : Protocol		Mr. Chimman Lal)	Period of Analysi Receipt Date Sampling Date Sampling Quanti Sampling Type	s : 31/03/2023-04/04 : 31/03/2023 : 27/03/2023 ty : 5.0 Ltrs. : Grab : TC62992320000	/2023 1283F	
S.No.	Test Parameters	Endrotab Verdan Ener Irolan Perdan Ener 5 Verdan Givent al	Test Method	asl, alı Varshro 1 6 Varshro Envesi 1arı (Inviral) ab	Results	Units
1	pH (at 25°C)	ovice) als Vacian () Vice and Constant Irol als Vaciant Press	IS:3025 (P-1	1)	7.69	drotale V
2	Turbidity	Knyleritzis Vantoni	IS:3025 (P-1	0)	5.10	NTU
3	Colour	Columbia Constanti Serve	IS: 3025 (P-	4)	BLQ(LOQ-1.0)	Hazen
4	Odour	undered ante Constitute (17	IS: 3025 (P-	5)	Agreeable	frot es V
5	Total Hardness as Ca	CO3	IS:3025 (P-2	1)	163.35	mg/L
6	Chloride as Clarge	Envirotinis Vacunti	IS:3025 (P-3	2)	87.22	mg/L
7	Dissolved Oxygen	ROLDS VANDLEL NO	IS:3025 (P-3	8)	6.00	mg/L
8	Cyanide as CN	ovinolists vandan ta	IS:3025 (P-2	(7)	BLQ(LOQ-0.02)	mg/L
9	Total Dissolved Solid	S Varduri Univolu	IS:3025 (P-1	6)	320.00	mg/L
10	Sulphate (as SO4)	Emdro lab Vardan	IS:3025 (P-2	(4)	18.04	mg/L
11	Fluoride (as F)	irolab Vindin Los	APHA, 4500 F I	B&D	0.39	mg/L
12	Chemical Oxygen Der	nand	IS:3025 (P-5	(8)	49.00	mg/L
13	Biological Oxygen De	mand	IS 3025 (Part	-44) - EnviroLo	10.28	mg/L
14	Lead oLab Vardan	Enviral ab Vardau rolab Vardau	VEL/STP/ICP/W-01, Issue 1 01/11/2021	No. 01, Issue date 1	BLQ(LOQ-0.002)	mg/L
15	Selenium	Vielas Erenoului renolues Vielanes	VEL/STP/ICP/W-01, Issue I 01/11/202	No. 01, Issue date 1	BLQ(LOQ-0.001)	mg/L
16	Iron	retañ Vanhie Frid Emiral 16 Verlat	VEL/STP/ICP/W-01, Issue I 01/11/202	No. 01, Issue date 1	0.013	mg/L
17	Arsenic as As	Verdan Luveral al-	VEL/STP/ICP/W-01, Issue 1 01/11/202	No. 01, Issue date 1	BLQ(LOQ-0.005)	mg/L
18	Oil & Grease	ab Yanlın Lerinite	IS:3025 (P-3	39)	BLQ(LOQ-0.4)	mg/L



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



Page No. 2/2

Test Report

ampie	ENUMBER: VELISW/03	DSW/03 Report No.		
S.No.	Test Parameters	Test Method	Results	Units
19	Total Chromium	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	BLQ(LOQ-0.002)	mg/L
20	Phenolic Compounds	IS:3025 Part-43	BLQ(LOQ-0.0005)	mg/L
21	Anionic Detergent as MBAS	IS:3025 Part- 68	BLQ(LOQ-0.05)	mg/L
22	Zinc	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	0.036	mg/L
23	Copper and the could want to	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	BLQ(LOQ-0.002)	mg/L
24	Cadmium	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	BLQ(LOQ-0.002)	mg/L
25	Calcium as Ca	IS: 3025 (P-40)	49.59	mg/L
26	Total Alkalinity as CaCO3	IS:3025 (P-23)	157.32	mg/L
27	Magnesium as Mg	APHA, 3500 Mg B, Calculation Method	9.56	mg/L
28	Aluminium	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	BLQ(LOQ-0.002)	mg/L
29	Boron	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	BLQ(LOQ-0.01)	mg/L
30	Manganese as Mn	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	BLQ(LOQ-0.01)	mg/L
31	Mercury (as Hg)	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	BLQ(LOQ-0.0005)	mg/L

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

			Lode Mo. WI
Sample Number : VEL/SW/0	03	Report No.	: VEL/SW/2303311003/N
Name & Address of the Party	: M/s Raipur Energen Limited (Formerly GMR Chhatlisgarh Energy Ltd.) Village-	Format No Party Reference No	: 7.8 F-03 : 5703004128 (21/04/2022)
	Raikheda, Block- Tilda, Dist-Raipur, Chhattisgarh.	Reporting Date	; 08/04/2023
		Period of Analysis	: 31/03/2023-04/04/2023
		Receipt Date	: 31/03/2023
Sample Description	: Surface Water	Sampling Date	: 27/03/2023
Location	: Raikheda Pond Water men of an Unrolan Tinyi	Sampling Quantity	5.0 Ltrs.
Sample Collected By	: VEL Representative (Mr. Chimman Lal)	Sampling Type	: Grab
Environmental Condition	: OK		
Sampling and Analysis	: IS : 3025 & APHA		

š.No.	Test Parameters	Test Method	Results	Units
1	Residual Free Chlorine	IS :3025 (P-26)	BLQ(LOQ-0.15)	mg/L
2	Nitrate as NO3	IS:3025 (P - 34)	11.15	mg/L

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- Laboratory is not responsible for the authenticity of phy The report no, with Suffix A-Amended Report.
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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Hr) ISO 9001 | ISO 14001 | ISO 45001



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Test Report

ample Number : VEL/SW/ lame & Address of the Party sample Description .ocation iample Collected By Invironmental Condition	04 : M/s Raipur Energen Li (Formerly GMR Chhat Raikheda, Block- Tilda : Surface Water : Bangoli Dam : VEL Representative (I : OK : IS : 3025 & APHA	imited tisgarh Energy Ltd.) Village- a, Dist-Raipur, Chhattisgarh. Mr. Chimman Lal)	Report No. Format No Party Reference I Reporting Date Period of Analysi Receipt Date Sampling Date Sampling Quanti Sampling Type	: VEL/SW/2303311 : 7.8 F-03 % : 5703004128 (21/4 : 08/04/2023 s : 31/03/2023-04/04 : 31/03/2023 ; 27/03/2023 fy : 5.0 Ltrs. : Grab : TC62992320000	004 04/2022) /2023
rotocol S No. Test Parameters		Test Metho	d l	Results Links	
		musik Vordon Envirola Vorden Envirolati Van	n Vardon Emirio dan Envirota) d	indian Envirolatio	otaio Va Viedan (
1 pH (at 25°C)	The state of the s	IS:3025 (P-1	(1)	7.56	aralah b
2 Turbidity	hond of the Cardon	IS:3025 (P-1	(0) the Vandars I	4.80	NTU
3 Colour	A LI - AND A STATE OF A LINE	IS: 3025 (P-	4)	BLQ(LOQ-1.0)	Hazen
4 Odour	Stideo Oth Vertilia Tr	IS: 3025 (P-	5) I Carden EA	Agreeable	Virot. to V
5 Total Hardness as Ca	CO3	IS:3025 (P-2	21)	158.40	mg/L
6 Chloride as Cl	Invice on Working	IS:3025 (P-3	32)	70.72	mg/L
7 Dissolved Oxygen	in the second second	IS:3025 (P-3	38)	6.3	mg/L
8 Cyanide as CN	uvinite) vin on ti	IS:3025 (P-2	27)	BLQ(LOQ-0.02)	mg/L
9 Total Dissolved Solid	Is	IS:3025 (P-1	16)	200.00	mg/L
10 Sulphate (as SO4)	and a state of the state of	IS:3025 (P-	24)	18.87	mg/L
11 Fluoride (as F)	Am Top Verdan Fren	APHA, 4500 F	B & D	0.35	mg/L
12 Chemical Oxygen De	mand	IS:3025 (P-	58)	40.84	mg/L
13 Biological Oxygen De	emand	IS 3025 (Part	-44) in Envirola	10.02	mg/L
14 Lead	Coulestate variant	VEL/STP/ICP/W-01, Issue 01/11/202	No. 01, Issue date 1	BLQ(LOQ-0.002)	mg/L
15 Selenium	Manage - 1 - 1	VEL/STP/ICP/W-01, Issue 01/11/202	No. 01, Issue date 1	BLQ(LOQ-0.001)	mg/L
16 Iron	Cinet Carlo Carlo	VEL/STP/ICP/W-01, Issue 01/11/202	No. 01, Issue date 1	BLQ(LOQ-0.01)	mg/L
17 Arsenic as As		VEL/STP/ICP/W-01, Issue 01/11/202	No. 01, Issue date 1	BLQ(LOQ-0.005)	mg/L
18 Oil & Grease	do vata in Luisiouri	IS:3025 (P-	39)	0.40	mg/L



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Page No. 2/2

Test Report

ample Number : VEL/SW/04		Report No.	Report No. ; VEL/SW/2303311004		
S.No.	Test Parameters	est Parameters Test Method		Units	
19	Total Chromium	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	BLQ(LOQ-0.002)	mg/L	
20	Phenolic Compounds	IS:3025 Part-43	BLQ(LOQ-0.0005)	mg/L	
21	Anionic Detergent as MBAS	IS:3025 Part- 68	BLQ(LOQ-0.05)	mg/L	
22	Zinc	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	0.026	mg/L	
23	Copper	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	BLQ(LOQ-0.002)	mg/L	
24	Gadmium	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	BLQ(LOQ-0.002)	mg/L	
25	Calcium as Ca	IS: 3025 (P-40)	53.56	mg/L	
26	Total Alkalinity as CaCO3	IS:3025 (P-23)	142.10	mg/L	
27	Magnesium as Mg	APHA, 3500 Mg B, Calculation Method	5.95	mg/L	
28	Aluminium	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	BLQ(LOQ-0.002)	mg/L	
29	Boron	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	BLQ(LOQ-0.01)	mg/L	
30	Manganese as Mn	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	BLQ(LOQ-0.01)	mg/L	
31	Mercury (as Hg)	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	BLQ(LOQ-0.0005)	mg/L	

End of Report

BLQ-Below Limit of Quantification, LOQ-Limit of Quantification



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Test Report

				Page No. 1
Sample Number : VEL/SW/	14	Report No.	: VEL/SW/230331	1004/N
Name & Address of the Party	: M/s Ralpur Energen Limited (Formerly GMR Chhattisgarh Energy L Raikheda, Block- Tilda, Dist-Raipur, C	td.) Village- Party Reference N hhattisgarh. Reporting Date	: 7.8 F-03 • : 5703004128 (21/ : 08/04/2023	04/2022)
Sample Description	: Surface Water	Period of Analysis Receipt Date Sampling Date	: 31/03/2023-04/0 : 31/03/2023 · 27/03/2023	4/2023
Location	: Bangoli Dam	Sampling Quantit	\$ 5.0 Ltrs.	
Sample Collected By Environmental Condition	: VEL Representative (Mr. Chimman La : OK	i) Sampling Type	: Grab	
Sampling and Analysis Protocol	: IS : 3025 & APHA			
S.No. Test Parameters	envicet ab Vardan Großer (1997) Irolah Vardan Erst obab ir adı Mardan Erst irolah Vardan Dir	Test Method	Results	Units
1 Residual Free Chlorin	e	IS :3025 (P-26)	BLQ(LOQ-0.15)	mg/L

BLQ-Below Limit of Quantification, LOQ-Limit of Quantification

End of Report

IS:3025 (P - 34)



Nitrate as NO3

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mg/L

mg/L

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Page No. 1/2

Test Report

1000	EXCOLUTION AND AND AND AND AND AND AND AND AND AN				a balanta batava bata bata	
ample Number: VEL/SW/05			Report No.	: VEL/SW/2303311	1005	
Name & Address of the Party :		: M/s Raipur Energen L (Formerly GMR Chhat	Limited Format No attisgarh Energy Ltd.) Village- Party Reference N Reporting Date		: 7.8 F-03 No : 5703004128 (21/04/2022)	
		Raikheda, Block-Tilda			: 08/04/2023	200201150
				Period of Analysis	: 31/03/2023-04/04	/2023
	and all the days for the two set all Variation of			Receipt Date	; 31/03/2023	
Sample	Description	: Surface Water		Sampling Date	: 27/03/2023	
ocatio	n reirolh Viedbe	: Mura Pond Water		Sampling Quantit	y : 5.0 Ltrs.	
ample	Collected By	: VEL Representative ()	Mr. Chimman Lal)	Sampling Type	: Grab	
ampli	nmental Condition	: OK		Call Mar Barn Loren	etals vardan to	
rotoc	ol	: IS : 3025 & APHA		ULR No.	÷ TC62992320000	1297F
S.No.	Test Parameters	TrivinoLab Vandan IroLab Vandao Envi	Test Metho	d	Results	Units
nelat 2015	Vandan Enviroten evirotai) Vaniae E		Wandian EnvirolLab Vari ViritLish Vandim Enviro	Cont Centiero Colle VI Calle Marctone Court	n dua (Emaicoluit) Infusio Vandua Err	Cardron I
1	pH (at 25°C)	frot di Vardan End	IS:3025 (P-1	1)	7.73	-
2	Turbidity	Envirol.ab Vardan	IS:3025 (P-1	(0)	5.80	NTU
3	Colour	and a set of an international set	IS: 3025 (P-	4)	BLQ(LOQ-1.0)	Hazen
4	Odour	Admitab Vardan D	IS: 3025 (P-	5)	Agreeable	Hot.e.
5	Total Hardness as Ca	CO3	IS:3025 (P-2	21)	123.75	mg/L
6	Chloride as Cl	Unvicotals Variabili	IS:3025 (P-3	32)	61.29	mg/L
7	Dissolved Oxygen	tratals værdan enve	IS:3025 (P-3	38)	5.40	mg/L
8	Cyanide as CN	uvirotab varion En	IS:3025 (P-2	27)	BLQ(LOQ-0.02)	mg/L
9	Total Dissolved Solid	s o Vandule Energola	IS:3025 (P-1	16}	244.00	mg/L
10	Sulphate (as SO4)	Envirolati Vardan-	IS:3025 (P-2	24)	21.35	mg/L
11	Fluoride (as F)	unat ab Vandan Kuns	APHA, 4500 F	B&D	0.36	mg/L
12	Chemical Oxygen Der	mand	IS:3025 (P-5	58)	49.00	mg/L
13	Biological Oxygen De	mand	IS 3025 (Part	-44)	8.95	mg/L
14	Lead	EtwiceLik Vardan	VEL/STP/ICP/W-01, Issue 1 01/11/202	No. 01, Issue date 1	BLQ(LOQ-0.002)	mg/L
15	Selenium	o Vociliari, Erroinatuilo corroludi Vaedan Er	VEL/STP/ICP/W-01, Issue 01/11/202	No. 01, Issue date	BLQ(LOQ-0.001)	mg/L
16	Iron	antati Virutas Covi Costruitate Nacioni	VEL/STP/ICP/W-01, Issue 01/11/202	No. 01, Issue date 1	BLQ(LOQ-0.01)	mg/L
17	Arsenic as As	Sector Division	VEL/STP/ICP/W-01, Issue 01/11/202	No. 01, Issue date	BLQ(LOQ-0.005)	mg/L
18	Oil & Grease	ab Varitan Exercise	IS:3025 (P-	39)	0.60	mg/L

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Test Report

ample	Number: VEL/SW/05	: VEL/SW/230331	1005	
S.No.	Test Parameters	Test Method	Results	Units
19	Total Chromium	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	BLQ(LOQ-0.002)	mg/L
20	Phenolic Compounds	IS:3025 Part-43	BLQ(LOQ-0.0005)	mg/L
21	Anionic Detergent as MBAS	IS:3025 Part- 68	BLQ(LOQ-0.05)	mg/L
22	Zinc	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	0.023	mg/L
23	Copper	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	BLQ(LOQ-0.002)	mg/L
24	Cadmium	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	BLQ(LOQ-0.002)	mg/L
25	Calcium as Ca	IS: 3025 (P-40)	43.64	mg/L
26	Total Alkalinity as CaCO3	IS:3025 (P-23)	127.50	mg/L
27	Magnesium as Mg	APHA, 3500 Mg B, Calculation Method	3.56	mg/L
28	Aluminium	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	BLQ(LOQ-0.002)	mg/L
29	Boron	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	BLQ(LOQ-0.01)	mg/L
30	Manganese as Mn	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	BLQ(LOQ-0.01)	mg/L
31	Mercury (as Hg)	VEL/STP/ICP/W-01, Issue No. 01, Issue date 01/11/2021	BLQ(LOQ-0.0005)	mg/L

BLQ-Below Limit of Quantification,LOQ-Limit of Quantification

End of Report



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7.33

mg/L

Test Report

				Page No. 1/1
Sample Number : VEL/SW/	05	Report No.	; VEL/SW/230331	1005/N
Name & Address of the Party	: M/s Raipur Energen Limited (Formerly GMR Chhattisgarh Energy Ltd.) Raikheda, Block- Tilda, Dist-Raipur, Chhat	Format No Village- Party Reference No tisgarh. Reporting Date	: 7.8 F-03 : 5703004128 (21/04/2022) : 08/04/2023	
		Period of Analysis Resolut Date	: 31/03/2023-04/0	4/2023
Sample Description	: Surface Water : Mura Pond Water	Sampling Date Sampling Quantity	: 27/03/2023	
Sample Collected By Environmental Condition	: VEL Representative (Mr. Chimman Lal) : OK	Sampling Type	: Grab	
Sampling and Analysis Protocol	: IS : 3025 & APHA			
S.No. Test Parameters	Kriste ut. de Verdaar, in de otals van T Rokade Vlasten Berk oksib Verdan k I Van daar Frederiksib Verdary brehed	est Method 1 ab Vandan 1 hv Standard Mandan Envirol. Ab Vandan Envirol.ab Va	Results	Units
1 Residual Free Chlorin	e 15	:3025 (P-26)	BLQ(LOQ-0.15)	mg/L

""End of Report"

IS:3025 (P - 34)

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Nitrate as NO3

BLQ-Below Limit of Quantification, LOQ-Limit of Quantification

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Approved By)

Project Name: M/s Raipur Energen Limited (Formerly GMR Chhattisgarh Energy Ltd.), Village- Raikheda, Block- Tilda, District- Raipur, Chhattisgarh

4th Quarterly Environmental Monitoring Report

4.5 Soil Quality Analysis:-



Figure No. 8 Plan Showing Soil Sample Monitoring Location Map

Soil Quality Monitoring Locations

Location Code:-

S1- Chicholi Village

S2- Gaitara Village

S3- Raikheda Village

S4- Mura Village

S5- Near Field Hostel

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Page No. 1/2

Test Report

Sample Number : VEL/S0/01	and the second sec	Report No.	: VEL/S0/2303311001-A
Name & Address of the Party	: M/s Raipur Energen Limited	Format No	- 7.8 F-03
	(Formerly GMR Chhattisgarh Energy Ltd.) Village-	Party Reference No	: 5703004128 (21/04/2022)
	Raikheda, Block- Tilda, Dist-Raipur, Chhattisgarh.	Reporting Date	: 08/04/2023
		Period of Analysis	: 31/03/2023-05/04/2023
Sample Description	: SOIL	Receipt Date	: 31/03/2023
Location	: ACW Area	Sampling Date	: 22/03/2023
Sample Collected By	: VEL Representative (Mr. Chimman Lal)	Sampling Quantity	: 3.0 Kg
Environmental Condition	: Ok	Sampling Type	: Composite
Parameter Required	: As per work order	Packing Status	: Sealed Pack
Sampling and Analysis Protocol	: IS 2720, APHA & USDA	ULR No.	:TC629923200001265F

S.No.	Parameters	neters Test Method		Units
		and the second s	1.1.1.1.1.1.1.1	1990
1	pH	IS:2720 Part-26	7,69	
2	Conductivity at 25°C	IS:14767	0.279	mS/cm
3	Colour	VEL/STP/EN/67,Issue No 01,ssue date 01/11/2021	Brownish	
4	Water holding capacity	VEL/STP/EN/86, Ilssue No 01,Issue date 01/11/2021	39.07	%
5	Bulk density	VEL/STP/EN/59, Issue No 01,Issue date 01/11/2021	1.35	gm/cc
6	Chloride	VEL/STP/EN/69, Issue No 01,ssue date 01/11/2021	93.98	mg/100gm
7	Exchangeable Calcium as Ca	VEL/STP/EN/72, Issue No 01,ssue date 01/11/2021	357.31	mg/100gm
8	Sodium Exchangeable as Na	VEL/STP/EN/62, Issue No 01,ssue date 01/11/2021	169.68	mg/kg
9	Exchangeable Potassium as K	VEL/STP/EN/62, Issue No 01,ssue date 01/11/2021	298.47	kg. /hec.
10	Organic Matter	IS:2720 Part-22	0.53	%
11	Exchangeable Magnesium as Mg	VEL/STP/EN/72. Issue No 01,ssue date 01/11/2021	152.87	mg/100gm
12	Available Nitrogen	IS:14684	245.25	kg. /hec.
13	Available Phosphorous as P	VEL/STP/EN/73, Issue No 01,ssue date 01/11/2021	49.35	kg. /hec.



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Test Report

Sample	ample Number : VEL/S0/01 Rep		: VEL/S0/2303311	001-A
S.No.	Parameters	Test Method	Results	Units
14	Total Zinc (as Zn)	VEL/STP/HW/03,Issue No 01,Issue date 01/10/2021	47.39	mg/kg
15	Total Manganese (as Mn)	VEL/STP/HW/03,Issue No 01,Issue date 01/10/2021	0.29	mg/kg
16	Total Chromium (as Cr)	VEL/STP/HW/03,Issue No 01,Issue date 01/10/2021	0.40	mg/kg
17	Total Lead (as Pb)	VEL/STP/HW/03,Issue No 01,Issue date 01/10/2021	0.22	mg/kg
18	Total Cadmium (as Cd)	VEL/STP/HW/03,Issue No 01,Issue date 01/10/2021	BLQ(LOQ-0.1)	mg/kg
19	Total Copper (as Cu)	VEL/STP/HW/03,Issue No 01,Issue date 01/10/2021	0.29	mg/kg
20	Soil Texture	VEL/STP/EN/64,Issue No 01,Issue date 01/11/2021	Silty loam	-

Note:-This report replaces our earlier report no.VEL/S0/2303311001,dated on 08/04/2023,due to typing error in the sampling location.

Amended report re-issued on dated 05/05/2023.BLQ-Below Limit of Quantification,LOQ-Limit of Quantification

End of Report



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Test Report

Sample Number : VEL/S0/02	1	Report No.	: VEL/S0/2303311002-A
Name & Address of the Party	: M/s Raipur Energen Limited	Format No	: 7.8 F-03
	(Formerly GMR Chhattisgarh Energy Ltd.) Village-	Party Reference No	: 5703004128 (21/04/2022)
	Raikneda, Block- Tilda, Dist-Raipur, Chhattisgarh.	Reporting Date	: 08/04/2023
		Period of Analysis	: 31/03/2023-05/04/2023
Sample Description	: SOIL	Receipt Date	: 31/03/2023
Location	: Weigh Bridge -01	Sampling Date	; 22/03/2023
Sample Collected By	: VEL Representative (Mr. Chimman Lal)	Sampling Quantity	: 3.0 Kg
Environmental Condition	: Ok	Sampling Type	: Composite
Parameter Required	: As per work order	Packing Status	: Sealed Pack
Sampling and Analysis	: IS 2720, APHA & USDA	ULR No.	: TC629923200001266F

Protocol

S.No.	Parameters	Test Method	Results	Units
1	рН	IS:2720 Part-26	7,48	
2	Conductivity at 25°C	IS:14767	0.261	mS/cm
3	Colour	VEL/STP/EN/67,Issue No 01,ssue date 01/11/2021	Brownish	
4	Water holding capacity	VEL/STP/EN/86, Ilssue No 01,Issue date 01/11/2021	36.81	%
5	Bulk density	VEL/STP/EN/59, Issue No 01,Issue date 01/11/2021	1.37	gm/cc
6	Chloride	VEL/STP/EN/69, Issue No 01,ssue date 01/11/2021	78.00	mg/100gm
7	Exchangeable Calcium as Ca	VEL/STP/EN/72, Issue No 01,ssue date 01/11/2021	420.08	mg/100gm
8	Sodium Exchangeable as Na	VEL/STP/EN/62, Issue No 01,ssue date 01/11/2021	156.93	mg/kg
9	Exchangeable Potassium as K	VEL/STP/EN/62, Issue No 01,ssue date 01/11/2021	167.22	kg. /hec.
10	Organic Matter	IS:2720 Part-22	0.57	%
11	Exchangeable Magnesium as Mg	VEL/STP/EN/72, Issue No 01,ssue date 01/11/2021	178.25	mg/100gm
12	Available Nitrogen	IS:14684	206.55	kg. /hec.
13	Available Phosphorous as P	VEL/STP/EN/73, Issue No 01,ssue date 01/11/2021	48.11	kg. /hec.



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Test Report

Sample	mple Number : VEL/S0/02 Report No.		: VEL/S0/23033110	002-A
S.No.	Parameters	Test Method	Results	Units
14	Total Zinc (as Zn)	VEL/STP/HW/03,Issue No 01,Issue date 01/10/2021	47.60	mg/kg
15	Total Manganese (as Mn)	VEL/STP/HW/03,Issue No 01,Issue date 01/10/2021	51.70	mg/kg
16	Total Chromium (as Cr)	VEL/STP/HW/03,Issue No 01,Issue date 01/10/2021	8.53	mg/kg
17	Total Lead (as Pb)	VEL/STP/HW/03,Issue No 01,Issue date 01/10/2021	1.58	mg/kg
18	Total Cadmium (as Cd)	VEL/STP/HW/03,Issue No 01,Issue date 01/10/2021	BLQ(LOQ-0.1)	mg/kg
19	Total Copper (as Cu)	VEL/STP/HW/03,Issue No 01,Issue date 01/10/2021	1.82	mg/kg
20	Soll Texture	VEL/STP/EN/64,Issue No 01,Issue date 01/11/2021	Silty loam	-

Note:-This report replaces our earlier report no.VEL/S0/2303311002,dated on 08/04/2023,due to typing error in the sampling location.

Amended report re-issued on dated 05/05/2023.BLQ-Below Limit of Quantification,LOQ-Limit of Quantification

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Test Report

P			Page 140, 1/2
Sample Number : VEL/S0/03		Report No.	: VEL/S0/2303311003-A
Name & Address of the Party	: M/s Raipur Energen Limited	Format No	: 7.8 F-03
	(Formerly GMR Chhattisgarh Energy Ltd.) Village-	Party Reference No	: 5703004128 (21/04/2022)
	Raikneda, Biock- Tilda, Dist-Raipur, Chhattisgarh.	Reporting Date	: 08/04/2023
		Period of Analysis	: 31/03/2023-05/04/2023
Sample Description	: SOIL	Receipt Date	: 31/03/2023
Location	: Guest House Area	Sampling Date	: 22/03/2023
Sample Collected By	: VEL Representative (Mr. Chimman Lal)	Sampling Quantity	: 3.0 Kg
Environmental Condition	: Ok	Sampling Type	: Composite
Parameter Required	: As per work order	Packing Status	: Sealed Pack
Sampling and Analysis	: IS 2720, APHA & USDA	ULR No.	: TC629923200001267F

Protocol

S.No.	Parameters	Test Method	Decide	41.44
			Results	Units
1	рН	IS:2720 Part-26	7.73	
2	Conductivity at 25°C	IS:14767	0.239	mS/cm
3	Colour	VEL/STP/EN/67,Issue No 01,ssue date 01/11/2021	Brownish	
4	Water holding capacity	VEL/STP/EN/86, Ilssue No 01,Issue date 01/11/2021	35.27	%
5	Bulk density	VEL/STP/EN/59, Issue No 01,Issue date 01/11/2021	1.26	gm/cc
6	Chloride	VEL/STP/EN/69, Issue No 01,ssue date 01/11/2021	89.74	mg/100gm
7	Exchangeable Calcium as Ca	VEL/STP/EN/72, Issue No 01,ssue date 01/11/2021	378.62	mg/100gm
8	Sodium Exchangeable as Na	VEL/STP/EN/62, Issue No 01,ssue date 01/11/2021	160.67	mg/kg
9	Exchangeable Potassium as K	VEL/STP/EN/62, Issue No 01,ssue date 01/11/2021	256.26	kg. /hec.
10	Organic Matter	IS:2720 Part-22	0.54	%
11	Exchangeable Magnesium as Mg	VEL/STP/EN/72, Issue No 01,ssue date 01/11/2021	127.50	mg/100gm
12	Available Nitrogen	IS:14684	222.78	ka, /hec
13	Available Phosphorous as P	VEL/STP/EN/73, Issue No 01,ssue date 01/11/2021	43.36	kg. /hec.



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Test Report

ample	Number: VEL/S0/03	Report No.	: VEL/S0/23033110	003-A
S.No.	Parameters	Test Method	Results	Units
14	Total Zinc (as Zn)	VEL/STP/HW/03,Issue No 01,Issue date 01/10/2021	41.48	mg/kg
15	Total Manganese (as Mn)	VEL/STP/HW/03,Issue No 01,Issue date 01/10/2021	55.45	mg/kg
16	Total Chromium (as Cr)	VEL/STP/HW/03,Issue No 01,Issue date 01/10/2021	9.28	mg/kg
17	Total Lead (as Pb)	VEL/STP/HW/03,Issue No 01,Issue date 01/10/2021	1.67	mg/kg
18	Total Cadmium (as Cd)	VEL/STP/HW/03,Issue No 01,Issue date 01/10/2021	BLQ(LOQ-0.1)	mg/kg
19	Total Copper (as Cu)	VEL/STP/HW/03,Issue No 01,Issue date 01/10/2021	2.00	mg/kg
20	Soil Texture	VEL/STP/EN/64,Issue No 01,Issue date 01/11/2021	Silty loam	-

Note:-This report replaces our earlier report no.VEL/S0/2303311003,dated on 08/04/2023,due to typing error in the sampling location.

Amended report re-issued on dated 05/05/2023.BLQ-Below Limit of Quantification,LOQ-Limit of Quantification

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Test Report

Sample Number : VEL/S0/0	4.	Report No.	: VEL/S0/2303311004-A
Name & Address of the Party	: M/s Raipur Energen Limited	Format No	: 7.8 F-03
	(Formerly GMR Chhattisgarh Energy Ltd.) Village-	Party Reference No	: 5703004128 (21/04/2022)
	Raikheda, Block- Tilda, Dist-Raipur, Chhatlisgarh.	Reporting Date	: 08/04/2023
		Period of Analysis	: 31/03/2023-05/04/2023
Sample Description	: SOIL	Receipt Date	; 31/03/2023
Location	: Gammon India Area L2 Gate	Sampling Date	: 22/03/2023
Sample Collected By	: VEL Representative (Mr. Chimman Lal)	Sampling Quantity	÷ 3.0 Kg
Environmental Condition	: Ok	Sampling Type	: Composite
Parameter Required	: As per work order	Packing Status	: Sealed Pack
Sampling and Analysis	: 15 2720, APHA & USDA	ULR No.	: TC629923200001268F

Protocol

S.No.	Parameters	Test Method	Results	Units
1	pH	IS:2720 Part-26	7.63	
2	Conductivity at 25°C	IS:14767	0.285	mS/cm
3	Colour	VEL/STP/EN/67,Issue No 01,ssue date 01/11/2021	Brownish	
4	Water holding capacity	VEL/STP/EN/86, Ilssue No 01,Issue date 01/11/2021	41.31	%
5	Bulk density	VEL/STP/EN/59, Issue No 01,Issue date 01/11/2021	1.28	gm/cc
6	Chloride	VEL/STP/EN/69, Issue No 01,ssue date 01/11/2021	70.33	mg/100gm
7	Exchangeable Calcium as Ca	VEL/STP/EN/72, Issue No 01,ssue date 01/11/2021	357.51	mg/100gm
8	Sodium Exchangeable as Na	VEL/STP/EN/62, Issue No 01,ssue date 01/11/2021	141.20	mg/kg
9	Exchangeable Potassium as K	VEL/STP/EN/62, Issue No 01,ssue date 01/11/2021	253.53	kg. /hec.
10	Organic Matter	IS:2720 Part-22	0.64	%
11	Exchangeable Magnesium as Mg	VEL/STP/EN/72, Issue No 01,ssue date 01/11/2021	140.23	mg/100gm
12	Available Nitrogen	15:14684	222.78	kg. /hec.
13	Available Phosphorous as P	VEL/STP/EN/73, Issue No 01,ssue date 01/11/2021	51.37	kg. /hec.



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Test Report

Sample	mple Number : VEL/S0/04 Report No.		: VEL/S0/2303311	004-A
S.No.	Parameters	Test Method	Results	Units
14	Total Zinc (as Zn)	VEL/STP/HW/03,Issue No 01,Issue date 01/10/2021	68.90	mg/kg
15	Total Manganese (as Mn)	VEL/STP/HW/03,issue No 01,issue date 01/10/2021	95.42	mg/kg
16	Total Chromium (as Cr)	VEL/STP/HW/03,Issue No 01,Issue date 01/10/2021	16.03	mg/kg
17	Total Lead (as Pb)	VEL/STP/HW/03,Issue No 01,Issue date 01/10/2021	2.45	mg/kg
18	Total Cadmium (as Cd)	VEL/STP/HW/03,Issue No 01,Issue date 01/10/2021	BLQ(LOQ-0.1)	mg/kg
19	Total Copper (as Cu)	VEL/STP/HW/03,Issue No 01,Issue date 01/10/2021	3.33	mg/kg
20	Soil Texture	VEL/STP/EN/64,Issue No 01,Issue date 01/11/2021	Silty loam	

Note:-This report replaces our earlier report no.VEL/S0/2303311004,dated on 08/04/2023,due to typing error in the sampling location.

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Test Report

Sample Number : VEL/S0/	05	Report No.	: VEL/S0/2303311005-A
Name & Address of the Party	: M/s Raipur Energen Limited	Format No	: 7.8 F-03
	(Formerly GMR Chhattisgarh Energy Ltd.) Village-	Party Reference No	: 5703004128 (21/04/2022)
	Raikheda, Block- Tilda, Dist-Raipur, Chhattisgarh.	Reporting Date	: 08/04/2023
		Period of Analysis	: 31/03/2023-05/04/2023
Sample Description	: SOIL	Receipt Date	: 31/03/2023
Location	: STP Area	Sampling Date	: 22/03/2023
Sample Collected By	: VEL Representative (Mr. Chimman Lal)	Sampling Quantity	: 3.0 Kg
Environmental Condition	: Ok	Sampling Type	: Composite
Parameter Required	: As per work order	Packing Status	: Sealed Pack
Sampling and Analysis	: IS 2720, APHA & USDA	ULR No.	: TC629923200001269F

Protocol

S.No.	Parameters	Test Method	Results	Units
1	рН	IS:2720 Part-26	7.46	
2	Conductivity at 25°C	IS:14767	0.284	mS/cm
3	Colour	VEL/STP/EN/67,Issue No 01,ssue date 01/11/2021	Brownish	
4	Water holding capacity	VEL/STP/EN/86, Ilssue No 01,Issue date 01/11/2021	41.19	%
5	Bulk density	VEL/STP/EN/59, Issue No 01,Issue date 01/11/2021	1.31	gm/cc
6	Chloride	VEL/STP/EN/69, Issue No 01,ssue date 01/11/2021	264.02	mg/100gm
7	Exchangeable Calcium as Ca	VEL/STP/EN/72, Issue No 01,ssue date 01/11/2021	251.99	mg/100gm
8	Sodium Exchangeable as Na	VEL/STP/EN/62, Issue No 01,ssue date 01/11/2021	152.37	mg/kg
9	Exchangeable Potassium as K	VEL/STP/EN/62, Issue No 01,ssue date 01/11/2021	96.32	kg. /hec.
10	Organic Matter	IS:2720 Part-22	0.64	%
11	Exchangeable Magnesium as Mg	VEL/STP/EN/72, Issue No 01,ssue date 01/11/2021	140.03	mg/100gm
12	Available Nitrogen	IS:14684	226.01	kg. /hec.
13	Available Phosphorous as P	VEL/STP/EN/73, Issue No 01,ssue date 01/11/2021	45.66	kg. /hec.



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Test Report

Sample	e Number : VEL/S0/05	Report No.	: VEL/S0/2303311	: VEL/S0/2303311005-A		
S.No.	Parameters	Test Method	Results	Units		
14	Total Zinc (as Zn)	VEL/STP/HW/03,Issue No 01,Issue date 01/10/2021	49.38	mg/kg		
15	Total Manganese (as Mn)	VEL/STP/HW/03,Issue No 01,Issue date 01/10/2021	66.26	mg/kg		
16	Total Chromium (as Cr)	VEL/STP/HW/03,Issue No 01,Issue date 01/10/2021	11.38	mg/kg		
17	Total Lead (as Pb)	VEL/STP/HW/03,Issue No 01,Issue date 01/10/2021	1.91	mg/kg		
18	Total Cadmium (as Cd)	VEL/STP/HW/03,Issue No 01,Issue date 01/10/2021	BLQ(LOQ-0.1)	mg/kg		
19	Total Copper (as Cu)	VEL/STP/HW/03,Issue No 01,Issue date 01/10/2021	2,39	mg/kg		
20	Soll Texture	VEL/STP/EN/64,Issue No 01,Issue date 01/11/2021	Silty loam	-		

Note:-This report replaces our earlier report no.VEL/S0/2303311005,dated on 08/04/2023,due to typing error in the sampling location. Amended report re-issued on dated 05/05/2023.BLQ-Below Limit of Quantification,LOQ-Limit of Quantification

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4th Quarterly Environmental Monitoring Report

4.6 Waste Water Sample Quality Analysis Report:-



Figure No. 9 Plan Showing Waste Water Sample Monitoring Location Map

Waste Water Quality Monitoring Locations

Location Code:-

WW1- STP Outlet (STP Plant) WW2- ETP Outlet (ETP Plant)

M/s Vardan EnviroLab, Plot No. 82A, Sector-5, IMT Manesar, Gurugram, Haryana - 122051 Page | 108

Vardan EnviroLa

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Test Report

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S.No. Test Parameters	rol so sar	Test Method	Result	Unit	Lin	nits as Per EPA	(ScheVI)	
Analysis Protocol	: As per wor : APHA & IS	k order alle hive han En Generation of alle Visional	eiroLab Var LErrvipoLab	ULR No.		: TC62992320	0001310F	
Environmental Condition	: OK	sensauve (wr. Chimman Lai	Istab yardi	Sampling '	Гуре	: Grab		
Sample Collected By	: Waste Water (STP Outlet) : STP Plant		Sampling Quantity		÷ 2.0 Ltrs.			
Sample Description			Sampling I	Date	ate : 27/03/2023			
the technolate Yorkan I.				Receipt Da	te	: 31/03/2023		
	Construct order, Frank, Port respon, Criminaguri,		Reporting	Date	: 10/04/2023			
	(Formerly 0 Raikheda,	3MR Chhattisgarh Energy Lt Block- Tilda, Dist-Raipur, Ch	d.) Village- hattisoarh	Party Refer	ence No	; 5703004128	(21/04/2022)	
Name & Address of the Party	01 : M/s Raipur Energen Limited			Format No		: 7.8 F-03		
Sample Number : VEL/WW/				Report No.	Report No. : VEL/WW/230		3311001	
							Page No. 1/1	

100	ot ab Vardan English V	en Envirotab Vardan Enviro enten Envirotab Vardan Ere		an Chvit	Water	Sewers	Irrigation
1	pH at 25°C	IS:3025 (p-11)	8.14	ab Varia	5.5 - 9.0	5.5 - 9.0	5.5 - 9.0
2	Total Suspended Solids(TSS), max.	IS: 3025 (P-17)	6.20	mg/L	100.0	600.0	200.0
3	Oil & Grease, Max.	Clause No-5 of IS:3025 (P-39)	0.60	mg/L	10.0	20.0	10.0
4	Biological Oxygen Demand, Max.	IS 3025 (Part-44)	14.00	mg/L	30.0	350.0	100.0
5	COD, Max.	APHA, 5220 B Open Reflux	57.17	mg/L	250.0	cawirplab	ant gold

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Test Report

S.No. Test Parameters	Test Method	Result	Unit Li	mits as Per EPA (ScheVI)
Analysis Protocol	: APHA & IS	da.lonivu	OLK NO.	0 00205232000013111
Parameter Required	: As per work order		III P No	: TO\$20023200001311E
Environmental Condition	: ОК		in Envirolatio Var	a salar indian Vardan Cr
Sample Collected By	: VEL Representative (Mr. Chimman Lal)		Sampling Type	: Grab
Location	: ETP Plant		Sampling Quantity	201trs
Sample Description	: Waste Water (ETP Outlet)		Sampling Date	: 27/03/2023
			Receipt Date	: 31/03/2023
			Period of Analysis	: 31/03/2023-07/04/2023
	Raikneda, Block- Tilda, Dist-Raipur, Chhati	isgam.	Reporting Date	: 10/04/2023
	(Formerly GMR Chhattisgarh Energy Ltd.)	Village-	Party Reference No	: 5703004128 (21/04/2022)
Name & Address of the Party	: M/s Raipur Energen Limited		Format No	: 7.8 F-03
Sample Number : VEL/WW	/02		Report No.	: VEL/WW/2303311002
				1 090 140, 17

COLAD SAMAN COMPANY	CALCULATION DECEMPTS OF MAIL 21		Concession 1			Contraction and Address	
e Moltads Muchan Contrologi ab Vandam Lewiget, do Karol 191, als Vandam Erwiget, do Karol	vaniar frainciae bij van dat n. Lovenia di Vandari Bride Lovenia di Vandari Bride		Varetan n Envé	Inland Surface Water	Public Sewers	Land for Irrigation	
pH at 25°C	IS:3025 (p-11)	8.26	p Abay	5.5 - 9.0	5.5 - 9.0	5.5 - 9.0	
Total Suspended Solids(TSS), max.	IS: 3025 (P-17)	8.20	mg/L	100.0	600.0	200.0	
Oil & Grease, Max.	Clause No-5 of IS:3025 (P-39)	0.80	mg/L	10.0	20.0	10.0	
Biological Oxygen Demand, Max.	IS 3025 (Part-44)	17.00	mg/L	30.0	350.0	100.0	
COD, Max.	APHA, 5220 B Open Reflux	73.51	mg/L	250.0	covingian a	eardi <u>n</u> t to	
	pH at 25°C Total Suspended Solids(TSS), max. Oil & Grease, Max. Biological Oxygen Demand, Max. COD, Max.	pH at 25°C IS:3025 (p-11) Total Suspended Solids(TSS), max. IS: 3025 (P-17) Oil & Grease, Max. Clause No-5 of IS:3025 (P-39) Biological Oxygen Demand, Max. IS 3025 (Part-44) COD, Max. APHA, 5220 B Open Reflux	pH at 25°C IS:3025 (p-11) 8.26 Total Suspended Solids(TSS), max. IS: 3025 (P-17) 8.20 Oil & Grease, Max. Clause No-5 of IS:3025 (P-39) 0.80 Biological Oxygen Demand, Max. IS 3025 (Part-44) 17.00 COD, Max. APHA, 5220 B Open Reflux 73.51	pH at 25°CIS:3025 (p-11)8.26Total Suspended Solids(TSS), max.IS: 3025 (P-17)8.20mg/LOil & Grease, Max.Clause No-5 of IS:3025 (P-39)0.80mg/LBiological Oxygen Demand, Max.IS 3025 (Part-44)17.00mg/LCOD, Max.APHA, 5220 B Open Reflux73.51mg/L	pH at 25°C IS:3025 (p-11) 8.26 5.5 - 9.0 Total Suspended Solids(TSS), max. IS: 3025 (P-17) 8.20 mg/L 100.0 Oil & Grease, Max. Clause No-5 of IS:3025 (P-39) 0.80 mg/L 100.0 Biological Oxygen Demand, Max. IS 3025 (Part-44) 17.00 mg/L 30.0	Inland Public pH at 25°C IS:3025 (p-11) 8.26 5.5 - 9.0 5.5 - 9.0 Total Suspended Solids(TSS), max. IS: 3025 (P-17) 8.20 mg/L 100.0 600.0 Oil & Grease, Max. Clause No-5 of IS:3025 (P-39) 0.80 mg/L 10.0 20.0 Biological Oxygen Demand, Max. IS 3025 (Part-44) 17.00 mg/L 30.0 350.0	

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4th Quarterly Environmental Monitoring Report

4.7 Stack Emission Monitoring Analysis Report:-



Figure No. 10 Plan Showing Stack Emission Monitoring Location Map

Stack Emission Monitoring Locations

Location Code:-

TPP (Unit-1) TPP (Unit-2)

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Test Report

Sample Number : VEL/S/01 Name & Address of the Party

General Information

: M/s Raipur Energen Limited (Formerly GMR Chhattisgarh Energy Ltd.) Village-Raikheda, Block- Tilda, Dist-Raipur, Chhattisgarh.

Report No. Format No Party Reference No : 5703004128 (21/04/2022) **Reporting Date** Period of Analysis **Receipt Date** ULR No.

Page No. 1/1

: VEL/S/2303311001-A

- 7.8 F-03

: 08/04/2023

- : 31/03/2023-05/04/2023
- : 31/03/2023
- : TC629923200001270F

Sample Description

: Stack Emission Monitoring

t Parameters	Test Method	R
Protocol used	: IS 11255 & EPA	
Sampling condition	: Isokentic	
Flow rate of Gas (LPM)	: 2.0	
Flow rate of PM (LPM)	; 24.9	
Velocity of Stack Gases (m/sec.)	: 17.47	
Temperature of Stack Gases - Ts ("C)	: 122.0	
Ambient Temperature - Ta (°C)	: 32.0	
Meteorological Condition	: Clear Sky	
Instrument calibration status	: Calibrated	
Height of stack(m)	: 275.0 Mtr	
Diameter of stack(m)	: 7.5 Mtr	
Make of stack	: MS	
Stack attached to	: ESP Outlet	
Sampling duration (Minutes)	: 40.1 Min	
Date of Sampling	: 28/03/2023	
Sample Collected By	: VEL Representative (Mr. Chir	mman Lal)
Sampling Location	: Unit-1	

S.No.	Test Parameters	Test Method	Results	Units	Limits as per CPCB
1	Particulate Matter (as PM)	1S:11255 (P-1)	35.81	mg/Nm3	50
2	Sulphur Dioxide (as SO2)	IS:11255 (P-2)	1206.00	mg/Nm3	-
3	Oxide of Nitrogen (as NOX)	IS:11255 (P-7)	250.43	mg/Nm3	
4	Mercury (as Hg)	VEL/ENV/STP/144, Issue No.01, Issue Date - 01/11/2021	BLQ(LOQ-0.005)	mg/Nm3	-

Note:-This report replaces our earlier report no.VEL/S/2303311001,dated on 08/04/2023,due to typographical error in height of stack. Amended report re-issued on dated 05/05/2023

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Page No. 1/1

Test Report

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Sample Number : VEL/S/02 Name & Address of the Party

: M/s Raipur Energen Limited (Formerly GMR Chhattisgarh Energy Ltd.) Village-Ralkheda, Block- Tilda, Dist-Raipur, Chhattisgarh.

Report No.	: VEL/S/2303311002-A
ormat No	: 7.8 F-03
Party Reference No	: 5703004128 (21/04/2022)
Reporting Date	: 08/04/2023
Period of Analysis	: 31/03/2023-05/04/2023
Receipt Date	: 31/03/2023
ULR No.	 TC629923200001273E

Sample Description

: Stack Emission Monitoring

General Information Sampling Location		Linit-2
Sample Collected By		VEL Representative (Mr. Chimman Lal)
Date of Sampling	÷	28/03/2023
Sampling duration (Minutes)	:	45.16 Min
Stack attached to	:	ESP Outlet
Make of stack	:	MS
Diameter of stack(m)	:	7.5 Mtr
Height of stack(m)	:	275.0 Mtr
Instrument calibration status	:	Calibrated
Meteorological Condition	:	Clear Sky
Ambient Temperature - Ta (°C)	:	33.0
Temperature of Stack Gases - Ts (°C)	;	126.0
Velocity of Stack Gases (m/sec.)	:	15.75
Flow rate of PM (LPM)	:	22.44
Flow rate of Gas (LPM)	:	2.0
Sampling condition	+	Isokentic
Protocol used	:	IS 11255 & EPA

S.No.	Test Parameters	Test Method	Results	Units	Limits as per CPCB
1	Particulate Matter (as PM)	IS:11255 (P-1)	39.42	mg/Nm3	50
2	Sulphur Dioxide (as SO2)	IS:11255 (P-2)	1134.00	mg/Nm3	anna e i ca
3	Oxide of Nitrogen (as NOX)	IS:11255 (P-7)	260.47	mg/Nm3	1000
4	Mercury (as Hg)	VEL/ENV/STP/144, Issue No.01, Issue Date - 01/11/2021	BLQ(LOQ-0.005)	mg/Nm3	

Note:-This report replaces our earlier report no.VEL/S/2303311002,dated on 08/04/2023,due to typographical error in height of stack. Amended report re-issued on dated 05/05/2023.

BLQ-Below Limit of Quantification,LOQ-Limit of Quantification

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4th Quarterly Environmental Monitoring Report

Chapter – 5.0 CONCLUSIONS

M/s RAIPUR ENERGEN LIMITED., 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.

S. No.	Environmental Parameters	Conclusions
5.1	Ambient Air Quality 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 PM ₁₀ , PM _{2.5} , NO ₂ , SO ₂ , CO, C ₆ H ₆ , NH ₃ , O ₃ , Pb, As, Ni, BaP, TSPM and Mercury are well within the prescribed limits of NAAQ Standards. People of township and of surrounding villages do not have any problems regarding the airqualityand have no grievances because of Thermal Power Plant activities.
5.2	Ambient Noise Environment	The observations taken at eight villages 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.
5.3	Ground, Surface & Waste Water Environment	The analytical result of the samples from the Ground Water of Villages, Surface Water from Pond & Dam, 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.
5.4	Soil Environment	The analytical result of the samples from the Soil shows that the concentrations of different soil parameters are well within prescribed limits and will not cause any adverse impact on surrounding area. People of Surrounding areas express satisfaction about the soil quality of that area.

Project Name: M/s Raipur Energen Limited (Formerly GMR Chhattisgarh Energy Ltd.), Village- Raikheda, Block- Tilda, District- Raipur, Chhattisgarh

4th Quarterly Environmental Monitoring Report

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5.5	Stack Emission Environment	The analytical result of the samples from the TPP (Unit-1 & Unit-2) shows that the concentrations of different stack parameters are well within prescribed limits and will not cause any adverse impact on surrounding area.
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All the above details show that Thermal Power Plant of M/s RAIPUR ENERGEN LIMITED is not causing any adverse impact on the human health and ecological balance.

M/s Vardan EnviroLab, Plot No. 82A, Sector-5, IMT Manesar, Gurugram, Haryana - 122051 Page | 115

END OF THE REPORT

Rainwater Harvesting Ponds at APL, Raipur Site

Annexure - III



HYDROGEOLOGICAL INVESTIGATION REPORT IN AND AROUND RAIKHEDA VILLAGE, BLOCK- TILDA

DISTRICT - RAIPUR (C.G.)

M/S RAIPUR ENERGEN LIMITED



PREPARED BY

ENVIBA ENVIRONMENTAL SERVICES

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5.	ANALYSIS OF WATER LEVELS	38
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1. INTRODUCTION

Adani Power Limited (APL), India's largest private sector thermal power producer, announced the completion of acquisition of Raipur Energen Limited, which owns and operates a 1,370 MW (2 X 685 MW) Supercritical power plant at Raikheda village, in Raipur District of Chhattisgarh.

The Raikheda power plant, which utilizes Boiler and Turbine Generator equipment supplied by Doosan Heavy Industries, S. Korea, is situated close to the coal bearing areas of Chhattisgarh. The addition of 1,370 MW capacity, along with the recently concluded acquisition of the 600 MW Korba West Power Co. Ltd., solidifies APL's position as India's largest private sector thermal power producer, with aggregate operating capacities of 12,450 MW and gives it a strong presence in India's leading power generating as well as power consuming regions.

With these developments, APL is now uniquely poised to contribute to the forthcoming growth phase of India's electricity sector, driven by a robust economic growth, as well as an increase in the market size led by reforms under the Government's ambitious "Power For All" vision. APL now has a healthy mix of open capacities as well as capacities tied up in long term PPAs, which provide it long term visibility while allowing it to tap into real growth opportunities. The Adani Group, with its established Pit-to-Plug presence, is confident of leveraging its strengths to achieve its long term goals, and contributing significantly to nation building.

This pre-eminent position of APL will be further consolidated upon completion of the 1,600 MW (2 X 800 MW) Ultra-supercritical power project, which is being constructed in Godda District of Jharkhand for supply of power to Bangladesh, and take the aggregate generation capacity to 14,050 MW.

About The Adani Group

Adani Power (APL), a part of the diversified Adani Group, is the largest private thermal power producer in India. The company has an installed thermal power capacity of 12,450 MW spread across four power plants in Gujarat, Maharashtra, Karnataka and Rajasthan. With the help of a world-class team of experts in every field of power, Adani Power is on course to achieve its growth potential. The company is harnessing technology and innovation to transform India into a power-surplus nation, and provide quality and affordable electricity for all.

1.1 OBJECTIVE AND SCOPE OF WORK

1.1.1 Objective and Scope

The broad objective of the present study is to establish the hydrogeological environment of the project area and study the impact on ground water and suggest strategies for mitigation.

The scope of work includes following points

- Conducting comprehensive hydrogeological studies, pumping test, chemical analysis of ground and surface water samples from the buffer zone of 10 km radius and particularly downstream side of ash dyke and its impact on the water regime for REL, TPP 2 X 685 NW,Raikheda, Block- Tilda, District-Raipur, Raipur Energen Limited.
- 2. Survey and hydrological data collection of 30 key wells of 10km radius are from the boundary of plant (buffer zone) of existing open wells/bore wells/piezometers and determine and record for each location including extermination of coordinates of the points by GPS and its plotting on map and water levels, pre & post monsoon levels. Yields, use, aquifer tapped etc.
- 3. Comprehensive hydrogeological assessment studies of the buffer zone discussing its geomorphology, digitized elevation model, geology, nature of water bearing formation sand depth to water table, long term ground water recharge, present ground water exploitation and present status of ground water development.
- 4. Conducting a pump test any existing plant/private bore well along with recuperation test. The pump test is required to find out the aquifer parameters like K,T and S. Interpretation of pump test data by software is included conducting pump test on any open well and its recovery test to find out aquifer parameters.
- 5. Collection of samples of ground water and few surface samples from the buffer zone and more from the downstream side of ash dyke for determination of 23 constituents and parameters comprising pH, Color, EC, TDS, Chloride, Sulphate, Calcium, Magnesium, Fluoride, Nitrate, Bicarbonate, Carbonate, Total Hardness, Total alkalinity and all the heavy and toxic elements including Hg (which are generally present in bottom ash).
- 6. Preparation of ground water quality report of 10 km radius area of buffer zone based the results of chemical analysis and its different maps showing the different contour maps on important constituents.
- 7. Hydrological and drainage studies of buffer zone, delineation of micro watersheds, its

catchment area, catchment yields, particularly of watershed covering the ash dyke.

- 8. Preparation of ground water contour map of 10 km radius area showing the Ground water flow direction and hydraulic gradient.
- 9. Submission of draft report covering the findings of the investigations, original data and recommendations for future monitoring.
- 10. Submission of final report after incorporation of user observations.
- 11. The monitoring is to be carried out four times in a year i.e. January, May, August and November", ground water regime monitoring has been carried out under the present study. The study envisages regular monitoring of water level at select locations to observe the changes in ground water regime in time and space. The detailed hydro-geological study, already submitted forms base for the present monitoring work. The present report describes the behavior of ground water regime between January 2019 and November 2022, elucidates the analysis of ground water monitoring data and further depict overall picture of ground water regime along with changes in storage in time domain due to continuous abstraction of groundwater.

1.1.2 Approach and Methodology

To fulfill the above objectives, especially Hydrogeological study in the area, following approach has been adapted as given below:

- A detailed Hydrogeological investigation was carried out in & around Plant within 10 km of radius for both Core & Buffer Zone for evaluating the impact of project activity on ground water storage in the area.
- 2. Collection and collation of supplementary data viz. soils, geology, geomorphology, drainage etc. for interpretation.
- 3. Establishment of observation stations for water level measurements in different seasons as well as water sample collection for determining the quality aspects.
- 4. Pumping test data & its interpretation for knowing the hydrogeological parameters, etc.
- 5. Ground water resources have been estimated based on the norms recommended by GEC'97.
- 6. Evaluation of present ground water scenario as well as future course of action for protecting the natural environment.

2. GENERAL DESCRIPTION OF THE AREA

2.1 LOCATION

M/S Raipur Energen Limited is a1,370 MW (2 X 685 MW) Supercritical power plant at Village: Raikheda, Taluka: Tilda, Dist: Raipur, Chhattisgarh.

The co-ordinates of the Plant are $21^{\circ}26'23"$ N - $21^{\circ}27'48"$ N latitudes and $81^{\circ}50'34.6"$ E to $81^{\circ}52'08.5"$ E longitudes. For the present study, an area of 10 km of radius has been demarcated which lies between $21^{\circ}21'46.77"$ N - $21^{\circ}32'34"$ N latitudes and $81^{\circ}45'22.87"$ Eto $81^{\circ}56'58.41"$ E longitudes and falls under the Survey of India Top sheet No. 64 G/14 and G/15in parts (1:50000 scale). The location map of the project site and toposheet of study area is given in **Fig. 2.1, 2.2** and the Satellite image map of the area is given in **Fig. 2.3**.

2.2 ACCESSIBILITY

The area is well connected by metaled and un-metaled road as well as Rail networks. Tilda Railway station, on Mumbai- Howrah Broad Gauge main line of the South-Eastern-Central Railway is situated around 14 kms western direction from plant site. Raipur is nearest Airport and is about 65 km from the study area which is also approachable by road and rail. The block head quarter is Tilda.

2.3 DEMOGRAPHY

There are 59 villages within 10 km radius of plant area. The total population as per 2011 Census is **90074** (for 10 km radius buffer zone). Scheduled Caste population of the study area (10km) is 18462 and Scheduled Tribe is 5212, Percentage of literacy is 65%. The workers those actually engaged in occupation are 40921 Main workers are around 15201 while marginal workers are 33952. Rest of the total population, are considered as non-workers. A population detail is presented in table 2.1.

Name	NoHH	TOT_P	TOT_M	TOT_F	P_SC	M_SC	F_SC	P_ST	M_ST	F_ST
Nilja	463	2476	1250	1226	25	13	12	655	322	333
Mangasa	186	914	469	445	88	47	41	0	0	0
Mauhagaon	256	1255	628	627	893	442	451	8	3	5
Amlitalab	114	528	275	253	313	165	148	0	0	0
Bahesar	343	1694	847	847	593	301	292	25	14	11
Bangoli	438	1898	956	942	192	87	105	123	68	55

 Table 2.1 Population details as per census 2011
Name	NoHH	TOT_P	TOT_M	TOT_F	P_SC	M_SC	F_SC	P_ST	M_ST	F_ST
Baronda	419	2033	994	1039	556	278	278	13	7	6
Bartori	272	1202	606	596	465	227	238	76	41	35
Bartori 2	285	1573	769	804	2	0	2	125	66	59
Bharuwadih Kala	172	825	412	413	118	63	55	152	67	85
BharuwadihKhurd	151	738	373	365	361	185	176	0	0	0
Bhibhauri	290	1446	726	720	72	34	38	69	35	34
Changori	86	407	212	195	407	212	195	0	0	0
ChhachhanPahri	98	463	232	231	237	125	112	0	0	0
Chhadia	320	1518	746	772	548	289	259	0	0	0
Chhapora	240	1187	589	598	339	181	158	0	0	0
Chhataud	461	2219	1070	1149	231	103	128	40	18	22
Chicholi	236	1103	539	564	472	238	234	11	5	6
Deogaon	281	1245	613	632	388	201	187	84	34	50
Deori	294	1376	711	665	86	43	43	0	0	0
Dhansuli 1	254	1241	607	634	310	151	159	13	7	6
Gaitra	199	892	456	436	427	226	201	29	14	15
Ganiyari	393	2045	1022	1023	162	80	82	2	1	1
Gaurkheda	163	853	425	428	77	41	36	24	11	13
Jalso	200	932	478	454	20	11	9	87	44	43
Janjgira	219	1265	614	651	431	198	233	260	132	128
Kathiya 1	493	2410	1203	1207	541	283	258	326	158	168
Keotara	297	1469	758	711	674	352	322	151	77	74
Khamhariya	264	1252	612	640	80	38	42	287	139	148
Khapri	117	597	303	294	7	4	3	7	4	3
KhauliDabri	89	422	202	220	226	112	114	22	11	11
Khauna	786	3745	1894	1851	933	465	468	176	94	82
Khudmudi	200	969	506	463	235	120	115	0	0	0
Kodawa	290	1382	697	685	446	223	223	22	12	10
Konari	154	772	403	369	8	4	4	0	0	0
Kundru	916	4016	2071	1945	411	210	201	205	104	101
Kurra 1	251	1271	628	643	197	99	98	7	4	3
Madhi	506	2530	1231	1299	87	42	45	396	183	213
Math	453	2501	1434	1067	584	320	264	243	126	117
Mohrenga	525	2555	1275	1280	256	118	138	11	6	5
Mudpar 1	245	1189	573	616	192	98	94	0	0	0
Mura	531	2359	1188	1171	625	311	314	20	10	10

Name	NoHH	TOT_P	TOT_M	TOT_F	P_SC	M_SC	F_SC	P_ST	M_ST	F_ST
Nahardih	156	847	424	423	102	54	48	21	13	8
NaktiKhapri	152	735	365	370	368	180	188	0	0	0
NaktiKumhari	249	1215	599	616	175	83	92	47	23	24
Pachari	381	2112	1045	1067	987	501	486	268	133	135
Pachdeori	88	394	188	206	139	65	74	0	0	0
Paraswani	78	427	209	218	35	16	19	15	8	7
PatharaKundi	77	359	188	171	314	167	147	0	0	0
Pikaridih	256	1067	543	524	268	136	132	0	0	0
Raikheda	696	3541	1734	1807	52	25	27	305	139	166
Rajiya	199	906	435	471	277	139	138	20	10	10
Sirwe	232	1172	580	592	153	75	78	277	136	141
Sontara	227	1084	543	541	459	240	219	0	0	0
Tarasiw	322	1460	726	734	64	33	31	0	0	0
TekariParswani	430	1743	901	842	332	166	166	43	24	19
Tildadih	226	1009	532	477	365	188	177	0	0	0
Kharora (NP)	1961	9236	4632	4604	1057	521	536	547	270	277
Total	18680	90074	45241	44833	18462	9329	9133	5212	2573	2639



Fig 2.1: Location map the Study area



Fig 2.2: Top sheet (1:50000) of the Study area



Fig 2.3: Satellite of the Study area

2.4 LAND USE

In the study area, nearly 3239 ha is covered by irrigated area, 18626 ha is covered by non-irrigated area. Cultivable waste land area comes around 303 ha while 276 ha area is covered by area not available for cultivation. Details of land use pattern of the study area are presented in **Table 2.2** below and **Fig 2.4**.

Sno.	Crop type	Area in Sqkm	Percentage to total		
			area		
1	Rabi Crop	15.8699	5.05		
2	Kharif Crop	186.264	59.31		
3	Double Crop	16.5283	5.26		
4	Land Without Scrub	54.3982	17.32		
5	Land With Scrub	13.562	4.32		
6	Scrub forest	0.793647	0.25		
7	Fallows	2.76988	0.88		
8	Settlement	3.03294	0.97		
9	Water	16.1558	5.14		
10	Plant area	4.67	1.49		
		314.0447	100.00		

 Table 2.2: Land use Pattern of the Study Area (10 km radius from theProject site)

Source: Satellite Imagery



2.5 CROPPING PATTERNOF THESTUDYAREA

The study area represents agricultural plain and Green fields and lot of agricultural activities in the surroundings of villages are noticed. Base line data collected from Agriculture Department, Raipur and observed that majority of the area around the 10 Km. radius from the project site is distributed with following crops:

Kharif Crops: - Peddy, Cotton, Wheat, Maize, Jowar, Moong, Sunflower, Soyabean, Groundnut.

Rabi Crops- Gram Wheat, Jow, Tarameera, Sarson, Bhindi, Channa, Pea, Tomato, Palak, Raddish.

Cropping pattern of the area depends upon the climatological conditions and need of the local population of the area. Sometimes cropping pattern may get changed during construction and operational phase because of particular requirement of specified anthropogenic activities.

The study area shows typical agro climatic conditions. In spite of the agriculture being depend mainly on monsoon and underground water, cultivation is the major occupation of this region. The land is mono culture in nature besides the above-mentioned crops, banana, papaya, bar, ginger, methi, tomato, carrots, soya beans etc. are also grown in the area. The growth season of major crops are as shown in table 2.3.

S.NO.	NAMEOFCROP	PLANTATION MONTH	HARVEST SEASON
1.	PEDDY	JUNE-JULY	OCTOBER
2.	WHEAT	JAN.	MAY
3.	JOWAR	JULY	OCTNOV.
4.	COTTON	APRIL	JULY-AUGUST

 Table 2.3:
 Growth seasons of major crops

Most of the crops are grown on small farms (located near the village wells) where generally the work is done manually. A very little mechanized (with tractor) cultivation is also seen at times in certain areas.

2.6 CLIMATE AND SOILS

2.6.1 Climate:

The area enjoys 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 rainfall increases generally from the north-west to the south-east. About 94 percent of the annual rainfall is received during the period June to October, July and August being the rainiest months. The variation in annual rain fall from year to year is very large on an average the reared 50- 60rainy days in a year. There is only one observatory located in Raipur which is about 65 km away from the study area maintained by Indian Meteorology Department. The monthly average of different parameters of weather for the period 1980 to 2020 is presented in **Table-2.4** below.

Month	Mean Ter	mp.(°C)	Relative	Wind Velocity	Rainfall	EPT(mm)	
	Max	Min	Humidity (%)	(Km/Hr)	(mm)		
January	27	13	50	5	6.2	114	
February	30.8	16	39	6	12	132	
March	35	20	32	6.9	19	185	
April	40	26	30	8.4	13	221	
May	42	28.2	31.6	10.4	19	258	
June	37	26	58	122.1	205	195	
July	30	23	80.1	11.8	392	125	
August	30	23	80.1	10	358	122	
September	31	23.8	75	7	221	125	
October	31	26.1	64	6	57	144	
November	29	16.1	53	4	7	114	
December	27	13.1	52	4.1	3	104	
Avg./Total	32.5	21.2	53.7	16.8	1312.2	153	

Table-2.4. Climatological data of Observatory station at Raipur, IMD

2.6.2 Rainfall

During the Year 2007 to 2022 the maximum rainfall recorded 1593.85 mm in the year 2019 and minimum rainfall 716.41 mm had been recorded in the year 2017. Details are as shown in **Table 2.5**. In this year very low rainfall recorder, although ground water of this area falls under safe zone as well as forest is very dense, but precipitation was comparably too less. The average rainfall for last eleven year is average1174.85 mm. Out of the total annual rainfall about 90% of the takes place during the South West Monsoon i.e. among the months June to September. Only 8% of the rainfall takes place during the Winter Season from October to February while only 2% of the rainfall takes place during summer Season.

	Table 2.5: Rainfall (mm) data (2007-2022) of Raipur District, IMD												
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2007	0	19.5	0.2	0.2	4.1	525.2	320.1	284.6	238	28.3	14	0	1434.2
2008	6.5	10.1	2.6	1	5.8	262.8	233.1	279.5	289.7	23.4	0	0	1114.5
2009	0	0	0	2.1	4.9	25.8	571.8	246.4	66.4	20.1	10.5	0.3	948.3
2010	3.4	1	0	1.7	5	53.8	462.4	225	273.8	47.7	23.3	12	1109.1
2011	0	3.7	0.3	116.6	8.6	197.7	293.4	363.8	334.6	4.1	0.1	0	1322.9
2012	0	26.1	7.86	0	3.2	154.9	363.8	349.7	184.7	4.1	8.16	3.72	1106.5
2013	0	64.2	4.9	15.3	4.1	283.1	387.1	433.8	289	89.4	0	0	1570.8
2014	0	64.1	24.4	11.9	15.1	53.4	485.9	217.6	240.1	45.4	0	0	1157.9
2015	15.1	6.4	19.26	43.36	9	331.3	273.8	280.2	158.5	2.44	0	5.44	1144.7
2016	0	8.13	13	14.91	10.42	129.77	299.49	132.09	259.49	28.11	0	0	895.41
2017	0	0	0.5	0	17.3	177.7	170	148.4	111.5	91.45	0	0	716.41
2018	0	11.32	1.1	13.16	27.4	128.9	233.5	221.3	64.36	0	0	57.16	758.09
2019	0	64.2	4.9	15.3	4.1	283.1	387.1	433.8	289	89.4	23	0	1593.8
2020	28.6	77	38.4	22.9	40.4	298.3	216.6	580.6	285.8	72.6			1661.2
2021	12.8	4.8	10		39.6	220.4	315.8	71.4	295.6	25.2	25.2	39	1059.8
2022	10.2	2.4		5.4	6.8	225.4	296.2	460	132.2	65.2			1203.8
Ave.	4.78	22.68	8.49	17.58	12.86	209.5	331.8	295.5	219.5	39.80	7.4	8.40	1174.85



2.7 SOILS

Two main soil categories are present in the study area namely Ultisols and Vertisols, Soil map mop of the study area is presented in **Fig 2.5**.

2.7.1: Ultisols

The Indian equivalent of this soil found in study area is Lateritic and red yellow soil. It is exposed in south-east-north western part& central part in the 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. They are characterized by a humus-rich surface horizon and by a layer of clay that has migrated below the surface horizon. This soil has variety of clay minerals but in many cases the dominant mineral is Kaolinite. This clay has good bearing capacity and no shrink-swell property. They are red to yellow in color and are quite acidic having pH less than 5. The red and yellow color results from the accumulation of iron oxide which is highly insoluble in water.

2.7.2 :Vertisols

Indian equivalent of this soil is found in the area namely Medium black soil. They are exposed in north east to south western part of the study area. They are characterized by a high content of expanding and shrinking clay known as montmorillonite. They may also be characterized by salinity and well-defined layers of calcium carbonate or gypsum. Vertisols typically form from highly basic rocks such as basalts and are found typically on level or mildly sloping topography in climatic zones that have distinct wet and dry seasons. Depending on the parent material and the climate, they can range from grey or red to the more familiar deep black. Vertisols contain high level of plant nutrients, but, owing to their high clay content, they are not well suited to cultivation without painstaking management. Vertisols are especially suitable for rice because they are almost impermeable when saturated. Rain fed farming is very difficult because vetisols can be worked only under a very narrow range of moisture conditions as they become very hard when dry and become very sticky when wet. Deep black Soil of Vertisols is found in small patches of sounthern side of the study area.



2.8. DRAINAGE AND GEOMORPHOLOGY

2.8.1 Drainage

The area is drained by tributaries of Seonath River especially by Banjari River and Khorsi nala. Banjari River is north flowing tributary to Seonath River and flows in the northern while Khorsi nala flows in the east of project area. Thus, the project area is in the interfluves zone of Banjari & Khorsi and Kulhan. Seonath River is a perennial river while these three tributaries are ephemeral in nature. This tributary system comes under Mahanadi basin. The drainage pattern in the area is sub-parallel and dendritic in nature with medium drainage density indicating the formations in the area are moderately porous permeable in nature and are having moderate surface run-off. The drainage density in the central part near to project area is low as compare to remaining area. The drainage map of the study area is presented in **Fig 2.6**.

The study area is characterized by flat undulating terrain with regional slope to the north-east. The average elevation in the southern portion is around 270 m while in the central parts is 310 m amsl. The average land slope of the area is works out about 4m per km from top sheets (1:50000 scale), Survey of India.

Drainage network are universal feature of landscape on the earth. Various environmental factors such as climate, relief, lithology, and vegetation play a considerable role in the development of drainage basin. Watershed geomorphology helps in understanding the physical and hydrological behavior of the river regime.

2.8.2 Geomorphology:

Geo-morphologically the study area comes under Pediplain/pediment & Valleys. The Physiography of the basin is controlled by geological formations namely limestone, shale, and laterite.

The rocks were exposed to renewed post depositional activities and were subjected to intensive and extensive sedimentation, peneplanation and denudation during Pre-Quaternary and Quaternary time. In response to lithology of rocks, the alchemical composition, the irrelative deposition, tectonic setup, they were chiseled into various geomorphic and hydro-geomorphic surfaces; in this case Pediplain/pediment and valley fill. This unit is controlled by fractures, joints and lineaments. Flood Plain is also developed along the river courses. It is formed by extensive deposition of alluvium by major river system. This unit is normally flat/gently undulating land surface and located along river courses. This is primarily composed of of Khorsi and Banjari nala. The geomorphic features in the study area are shown in **Fig 2.7**.





3. GEOLOGY

The rocks of the Chhattisgarh super group represented by limestone and shale. A thin layer of alluvium/ laterite belonging to Quaternary period is found on the top surface. The generalized stratigraphic sequence of formation in and around the area is given in **Table 3.1** below.

Age	Supergroup	Group	Formation	Lithology					
QUATERNARY	Recent to		Alluvium and	Sand, Silt, Clay and					
	sub-recent		Laterite	lateritic Soil					
			Maniyarifm	Gypsiferous Shale					
			Hirrifm	Dolomitic limestone					
		Raipur Group	Tarengafm	Shale & Dolomite					
	Chhattisgarh	Kaipur Group	Chandifm	Limestone & Shale					
	Supergroup		Gunderdehifm	Shale					
PROTEROZOIC			Charmuriafm	Limestone & Shale					
		Chandrapur	Kanspatharfm	Sandstone, Siltstone Shale					
		Group	Choparadihfm	&Conglomerate					
		Group	Lohardifm						
		Bilari group	Intrusive,	Quartz veins, basic					
		Sonakhan gr	lakhadabri,	dyke ,Meta basalt Schist &					
		Baya group	Jonk&Chikhali	Gneisses					
ARCHAEAN	Basement crys	asement crystallines- Granite, gneisses ,granulite and Amphibolite							

Table-3.1 Generalized stratigraphic sequence of Raipur District

3.1.1 Basement Crystalline:

The basement crystalline belongs to Archaean age mainly consists of Granite, gneisses, granulite, phyllites and amphibolites. At places it is intruded by quartz veins. The overlying sedimentaries belongs to Chhattisgarh Super group of rocks. The contact between the Achaeans and the sedimentaries is faulted along the western margin of the basin.

3.1.2 Chhattisgarh Super group:

The crescent shaped Chhattisgarh basin within the Central Indian Craton can be subdivided into a small Baradwarproto-basin in the east and main Hirriproto-basin in the west. The entire succession of Chhattisgarh super group is divided into three groups. Lowermost Pairi group consists of sandstone, conglomerate, limestone and shale overlies unconformably on crystalline group and developed in the Baradwarproto-basin. The middle Chandrapur group un- conformably overlying

the Singhora group or older basement and consists of arenite formations and third is Raipur group at the top, comprising argillite-carbonate suite of rock.

3.1.2.1 Chandrapur group:

The sequence of Chandrapur group shows a variable thickness ranging from 20 m to as much as 90 m. The maximum thickness is attained in SE part of the basin, thinning westward as well as NE side and directly overlying the crystalline basement.

3.1.2.2 Raipur group:

The Raipur group comprising of predominantly argillite sequence conformably overlies the Chandrapur group with a gradational contact. The group has been subdivided into six sub-division representing three cycles of carbonate-argillite sediments as follows:

- **Charmuria formation** dominantly carbonates sequence and is conformably overlain by Gunderdehi formation.
- **Gunderdehi formation** dominantly a calcareous argillite purple colored shale with intercalated limestone is dominant member.
- **Chandi formation** comprise a major stromatolytic limestone sequence developed around southern side of Hirri sub-basin as arcuate outcrop pattern and is medium to course grained dolomitic limestone.
- **Tarenga formation** conformably overlies the Chandi formation and comprises cherty shale, calcareous shale and argillaceous dolomite, green and white clay.
- **Hirri formation** conformably overlies the Tarenga formation in south and Pandariaformation(coalesce of Charmuria, Gunderdehi, Chandi and tarenga formation) in the north. At places intra-formational conglomerate, dolomite and black shale contained gypsum as layer parallel to bedding.
- **Maniyari formation** named after the river along which the rock is best developed. It represents the closing phase of deposition in Chhattisgarh basin and consists of lower gypsiferous grey siltstone and shale followed by reddish brown calcareous and non-calcareous shale with limestone and dolomite.

3.1.3 Recent to sub-recent:

3.1.3.1 Laterite:

Insitu and rolled laterite occurs at many places in isolated patches. These are blanket deposits and few centimeters to few meters in thickness. The ferruginous rock formations of Chhattisgarh Supergroup are responsible for the formation of thin capping of laterite due to leaching and concentration of iron oxide from sandstone of Chandrapur group and also of limestone and shale of Raipur group.

3.1.3.2 Alluvium:

The alluvium consists of sand, silt and clay. The sands are fine to coarse grained and poorly sorted. The alluvial soils are mostly of residual in nature and are the weathered products f shale and limestone. The thickness of soil varies from few centimeters to over 10m in places.

3.2 LOCAL GEOLOGY:

The area is underlain by thin layer alluvial/laterite belonging to Quaternary period. Thick pile of rocks belonging to Raipur group of Younger Proterozoic period consisting of limestone and shale, underlie the alluvial sediments (**Fig 3.1**). The formation have general strike in NE-SW direction with very low dips of 2° to 3° due NW. Two sets of vertical joints trending in N50°E- S50°W and NE-SW direction are prominent in the area. The gap between joint plain is large from few centimeters to 5meters and are mostly interconnected. The lithological characters of various formations present in the study area are described as follows:

3.2.1 Soil/Laterite:

The major part of the area is underlain by alluvial residual soil covers which are loam and sandy loam. Laterites occur as capping associated with limestone and shale. The thickness of overburden varies from 2 to 6 m.

3.2.2 Grey shale:

Shale is softer in nature and do not outcrop in the area and lies below thin soil cover. It is buff grey in color and calcareous in nature. It splits easily along the bedding plains. They are generally horizontally laid. At places have low dips of 2 to 3 degrees towards North-west.

3.2.3 Dolomite:

Outcrops of dolomite exhibit typical 'Elephant Skin' weathering. It is dirty yellowish to brown in color. It is compact, hard, and massive. Outcrops of dolomite occur mainly in the western part of

the deposit and form a distinct zone. The dolomite occurs overlying the limestone and varies in thickness from 0.5m to as much as 24.0m.

3.2.4 Limestone:

Limestone forms the dominant rock type in the area. It is compact, fine grained, massive and chocolate brown to purple grey to grey in color. Analytical data shows that the limestone is thick and quite uniform in quality both laterally and vertically. Thickness of limestone in general is about 30m. Limestone forms a sharp boundary with dolomite occurring in the area. Shaly patches do occur within the limestone but its thickness is quite less.

3.2.5 Magnesium Limestone:

Limestone in the area is followed by fine grained, massive and compact magnesium limestone having a thickness of about 20m. Exploration data shows that the magnesium limestone occurs at a depth of about 235 amsl.

In order to understand the geological sequence fully well in the project site geological map of study area is **Fig 3.1**.



4. HYDROGEOLOGY

4.1 INTRODUCTION

Ground water occurrence is highly influenced by underlying geological formations and their hydrogeological characteristic. Weathered and fractured zones present in the rocks or formation provides scope of ground water occurrence, storage and its movement. Hydrogeology of the area broadly describes the disposition of aquifers, occurrence of ground water its movement, yield potential of water bearing formations, groundwater regime conditions in space and time etc. Detailed hydro-geological investigation has been carried out in and around the project area for elucidating the hydrogeology and establishing the interrelationships between various hydraulic parameters.

4.2 GROUND WATER OCCURRENCE AND AQUIFER SYSTEMS

In the study 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 occur within an average depth of 20m. 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 water 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 with depth ranges from 7 to 16 m. In general, the yield of dug wells ranges from 25 to $40m^3/day$. Deeper aquifer in the area mainly formed of Raipur group of rocks constituted of Chandi formation comprising limestone and shale. The deeper aquifers of the area are mostly developed by way of bore wells with depth range from 50 to 80 m. In general, the yield of bore wells ranges from 1 to 5 lps.

4.3 WATER TABLE CONFIGURATION AND FLOW DIRECTION

The flow direction is of two directions i.e. in western, central and northern part of the study area it is towards north-west and in southern part of the study area it is in south direction indicating the surface water divide in the central portion of the study area near to project area.

A local variation in flow direction is also observed which indicates the flow towards the mine pit in all directions. The Jamunia and Banjari nala flowing to north over the north-eastern part and Kulhan–

Pathra nala flowing westerly over western part of the study area are effluent in nature. The water table elevation in the study area ranges between 270 to 300 mamsl indicating more or less the plain terrain. North-western part of the area is having low altitude of water table elevation i.e. 270 mamsl while water table elevation increases to central& is maximum i.e. 300 mamsl. The gradient of water table is variable. In the area the yield ranges between 1 to 5 lps in central & eastern indicating the area is covered by stromatolitic limestone while in major part of the area it is 1 to 3 lps which is covered with shale & flaggy limestone. Hydrogeological map is given at **Fig.4.1 and 4.2**.



Fig 4.1 Water table contour and ground water flow direction





4.4 GROUND WATER REGIME MONITORING

The monitoring of ground water regime is of immense help 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 changes in ground water level and variation in ground water quality with respect to time and space. It is pertinent to say that any development of ground water resources in a particular area would bring changes in ground water regime if input to the ground water system is not balanced with output from the same system.

The study aims to observe the changes in ground water levels and quality with respect to the ground water development, which in turn would help in identifying the appropriate measures to be adopted for artificial recharge to ground water and neutralize the impact of the excessive ground water development. In the present report, the monitored data has been presented and the overall picture of ground water regime behavior due to continuous abstraction of ground water has been analyzed for the year 2022. Ground water regime monitoring was carried out four times in a year i.e. January May, August and November. The water level data of the month of May and November are taken as levels of pre-monsoon and post-monsoon respectively, Data presented and analysed for pre and postmonsoon water level data. The photographs of some monitoring stations are indicated in **plate: I**, which was taken during the collection of water level of ground water in all four seasons.





Gaitra, Chhattisgarh, India Unnamed Road, Gaitra, Chhattisgarh 493225, India Lat 21.453185° Long 81.844846° 28/11/22 03:52 PM GMT +05:30

Google











4.4.1 Distribution of monitoring stations

To study the change in ground water regime in and around study area, total of 35 monitoring wells were established at different locations for regular monitoring of ground water level. The basic details of these monitoring wells are presented in **Table 4.1** and their distribution is presented in **Fig 4.3**.



Fig 4.3: location of monitoring wells of the Study area

Sn	Village	Village GP		RL Of	Dia (m)	Lat (X)	Long
				ground			(Y)
				level			
1	Amlitalab	Devgaon	Tilda	279	5.2	81.8211	21.4153
2	Bharuwadih khurd	Bharuwadih Kala	Tilda	295	2.7	81.8967	21.4631
3	Chhataud	Chhataud	Tilda	295	2.8	81.8475	21.4983
4	Chicholi	Chicholi	Tilda	310	1.85	81.8606	21.4664
5	Deogaon	Devgaon	Tilda	282	2.9	81.8136	21.4247
6	Dhansuli	Dhansuli	Tilda	276	2.7	81.8353	21.41
7	Gaitara	Gaitra	Tilda	300	4.4	81.8458	21.4578
8	Gourkheda	Chicholi	Tilda	305	2.45	81.8722	21.4736
9	Khapri	Khapri	Tilda	295	1.75	81.8189	21.4536
10	Mohrenga	Mohrenga	Tilda	300	1.85	81.8844	21.4378
11	Mura	Mura	Tilda	292	2.1	81.8636	21.425
12	Paraswani	Nakti Kumhari	Tilda	295	7.95	81.8972	21.4764
13	Raikheda	Raikheda	Tilda	290	4.5	81.8367	21.4358
14	Sontara	Sontara	Tilda	293	3.9	81.8286	21.4458
15	Tarasiv	Tarasiw	Tilda	295	2.3	81.8467	21.4803
16	Bangoli	Bangoli	Tilda	282	2.05	81.8411	21.3992
17	Bharuwadih kala	Bharuwadih Kala	Tilda	291	2.5	81.9078	21.4611
18	Chhachhanpahri		Tilda	285	0.6	81.9209	21.513
19	Chhapora		Tilda	295	0.3	81.8575	21.5303
20	Janjgira	Janjgira	Tilda	290	3.8	81.7856	21.4539
21	Kathiya	Katiya	Tilda	296	2.4	81.9278	21.4789
22	Keotara	Kevtara	Tilda	292	4.25	81.8936	21.4881
23	Kharora	Kharora	Tilda	304	3.9	81.9233	21.3981
24	Khauna	Khauna	Tilda	280	2.25	81.8033	21.4094
25	Kodwa	Kodwa	Tilda	283	4.5	81.7758	21.4353
26	Konari	Khamriya	Tilda	293	2.9	81.8275	21.4936
27	Kundru		Tilda	283	0.7	81.7836	21.4806
28	Kurra	Kurra	Tilda	278	1.4	81.8311	21.3997
29	Math	Math	Tilda	304	3.2	81.9028	21.3928
30	Murdhpar	Mudhpar	Tilda	292	1.55	81.8722	21.3742
31	Nahardia	Chhadiya	Tilda	305	2.7	81.9467	21.4344
32	Nakti Khapri	Jalso	Tilda	299	2.7	81.8092	21.4792
33	Nilja	Nilja	Dharsiwa	272	2.9	81.7953	21.3828
34	Pikridih	Pikridih	Tilda	285	1.7	81.8603	21.3861
35	Siwai		Tilda	295	0.6	81.8067	21.5286
36	Tildadih	Tildadih	Tilda	291	3.1	81.8947	21.3756

Table 4.1: Basic details of established monitoring wells

5. ANALYSIS OF WATER LEVELS

5.1 INTRODUCTION

Ground water levels or piezometric heads is resultant of all input and output to ground water system with defined boundaries. Ground water is a dynamic system. The parameters required to be monitored during ground water regime monitoring are ground water level or piezometric heads and chemical quality. These are subject to change due to natural and or anthropogenic causes with respect to dime and space. Rainfall, natural recharge to ground water, ground water draft and seepage from surface water bodies plays important roles in changes in ground water level fluctuations. The quality of water is being recharge, nature of host rock and dilution/concentration of ground water impacts the changes in ground water quality. Monitoring of ground water quality and temperature are one of the essential components for ground water regime monitoring. The monitored data is analyzed in time and space to assess the changes and a relationship is established to determine the impact of ground water development and recharge to the system.

5.2 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.Ground water monitoring network planning is basic step for ground water regime monitoring and further, for assessment of groundwater resources and planning for development and management programs. The groundwater, being hidden resource can only be analyzed through its signatures 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 for planning and management of ground water resources and its sustainability. Modeling provides necessary information to the user agencies to frame contingency plans in case of unfavorable groundwater recharge situation.

The data have also immense utility in implementing the legal provisions of groundwater regulation, and to substantiate expert advice in legal issues arising out of conflicting interests of ground water users. Ground water regime data of different seasons have been collected for the year 2022, analyzed for every set of measurements and discussed with maps in following sections.

5.2.1 Analysis of water levels (2022)

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 5.1**.

Sn	Village	Depth to	Depth to	Depth to	Depth to	Fluctu	RL Pre
		water	water	water	water	ation (m)	monsoon
		level	level	level	level		water level
		(mbgl)	(mbgl)	(mbgl)	(mbgl)		(mamsl)
		Jan-22	May-22	Aug-22	Nov-22		
1	Amlitalab	2.98	5.20	1.00	2.10	3.10	273.80
2	Bharuwadih khurd	9.30	11.20	3.30	5.30	5.90	285.64
3	Chhataud	6.92	8.36	2.10	4.60	3.76	286.64
4	Chicholi	6.56	7.89	1.40	2.50	5.39	302.11
5	Deogaon	5.30	6.79	2.10	3.80	2.99	275.21
6	Dhansuli	2.21	3.78	1.10	2.00	1.78	272.22
7	Gaitara	4.50	6.84	1.39	2.90	3.94	293.16
8	Gourkheda	4.33	5.64	1.60	2.10	3.54	298.77
9	Khapri	3.12	4.90	1.30	2.50	2.40	290.10
10	Mohrenga	2.70	3.69	1.10	2.10	1.59	296.31
11	Mura	3.10	4.69	1.21	1.80	2.89	287.31
12	Paraswani	6.48	8.88	2.40	3.34	5.54	285.30
13	Raikheda	3.70	4.63	1.80	2.80	1.83	285.37
14	Sontara	5.33	6.70	2.60	3.80	2.90	286.77
15	Tarasiv	4.08	5.78	1.28	2.00	3.78	289.22
16	Bangoli	7.30	9.60	2.10	4.20	5.40	272.40
17	Bharuwadih kala	9.80	12.70	2.80	5.54	7.16	277.31
18	Chhachhanpahri	7.20	10.60	4.00	4.90	5.70	274.98
19	Chhapora	6.40	7.56	2.20	3.45	4.11	288.99
20	Janjgira	7.30	10.40	2.30	5.60	4.80	279.60
21	Kathiya	5.30	7.63	0.90	1.30	6.33	288.37
22	Keotara	6.20	8.03	1.30	4.50	3.53	283.04
23	Kharora	4.30	6.35	1.02	2.50	3.85	297.65
24	Khauna	6.55	8.77	2.11	5.27	3.50	270.30
25	Kodwa	4.35	6.00	1.08	2.00	4.00	277.00
26	Konari	6.14	7.50	1.01	1.30	6.20	285.50
27	Kundru	7.10	9.80	1.80	4.60	5.20	273.20
28	Kurra	9.56	11.47	2.10	5.61	5.86	266.53
29	Math	3.72	5.12	1.08	2.00	3.12	298.88
30	Murdhpar	5.70	7.23	0.98	2.30	4.93	284.77

Table 5.1: Depth to water levels monitored in the study area (during 2022)

31	Nahardia	6.21	8.47	2.40	5.20	3.27	296.53
32	Nakti Khapri	9.80	12.60	2.90	7.70	4.90	286.40
33	Nilja	3.12	5.70	1.06	2.01	3.69	266.30
34	Pikridih	5.21	7.56	1.10	2.70	4.86	277.44
35	Siwai	6.30	8.66	2.70	4.81	3.85	286.34
36	Tildadih	3.41	5.71	1.06	2.80	2.91	285.29

5.2.1.1 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 5.1, it is observed that the overall depth to water level remains between 3.69 to 12.7 meters below ground level. The pre-monsoon depth to water levels ranges between 5 and 10 mbgl in 5 km radius 60% of the villages, water levels more than 10 mbgl are observed in the villages namely Bharuwadih khurd villages and less than 5 observed in 33% villages. In 10 km radius depth to water levels ranges between 5 and 10 mbgl are observed in remaining 24 % villages of buffer zone. Water level less than 5 mbgl. recorded at Mohrenga,Dhansuli,Raikheda,Murra and Khapri villages in 5 km radius, shown in **Fig 5.1**.

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

The depth to water level map has been prepared based on ground water monitoring data of Nov 2022. On perusal of the data and map given at **Fig.5.2**, it is observed that the overall depth to water level remains between 1.3 and 7.7 meters below ground level. The post-monsoon depths to water level range of 0 to 3 mbgl are observed in 66% villages of core zone (5 km Radius), about 26% villages shows water level in the range of 3 to 5 mbgl and more than 5 mbgl at Bharuwadih khurd village. In the area of 10 km radius ground water levels less than 3 mbgl are observed in the 42% villages, about 29% villages shows water level in the range of 3 to 5 mbgl and more than 5 in 29% villages.

5.2.1.3 Seasonal water level fluctuation (May 2022 Vs Nov. 2022)

Based on the pre-monsoon & post-monsoon data water level fluctuation in the study area is calculated & respective map (**as shown in Fig 5.3**) has also been prepared. It is observed that in the study area water level fluctuation varies from 1.59 to 7.16 meters. Lower range of water level fluctuation is also observed along the river course followed by > 6. 4 to 6, & 2 to 4.












5. 3 COMPARISONS OF WATER LEVELS OVER THE YEARS

The ground water levels in the area have been monitored 4 times in a year as mentioned earlier. Mean water level (2019-2021) has been compared with water levels of year 2022, for pre-monsoon and post-monsoon period separately in core and buffer zones, to assess the change in ground water levels over the years. Keeping this in view, the water level data of last twelve years has been analysed to assess the change in water level behaviour. The said water levels of year 2019-2021 (mean) compared with respect to year 2022 both for pre-monsoon and post-monsoon period separately for core and buffer zones are presented in **Table 5.2**.

5.3.1 WATER LEVEL CHANGES

The water level data for last four years have been analysed to assess decline or rise in the ground water level through fluctuation in water level within the study area. Ground water level data for year 2022 has been analysed for core and buffer zones and changes in water levels through fluctuation with respect to the mean water levels (2019-2021) for different seasons is observed and presented in **Table 5.2**.

5.3.1.1 PRE-MONSOON DEPTH TO WATER LEVEL TREND

While comparing mean pre-monsoon average water levels of (2019-2021) with that of 2022 (Table 5.2), it is found that all the villages in core zone (5 Km Radius) which are considered for analysis showing decline in the range of -0.2 to -0.8 m. except Gaukheda and Paraswani villages (Fig 5.5) which are showing rise of water level in the ranges of 0.16 to 0.18 m and 57 % of the villages in buffer zone(10 Km Radius) are showing decline in range of -0.1 to -0.8 m while 43 % villages are showing rising in water level in the range of 0.02 to 4.96 m as shown in **Fig 5.6.** The area showing falling trend more than 20 cm/yr are of considerable significance which is attributed to increase in draft in selective patches. In conclusion, if the decline per year is more than 0.20 m then for the period of four years it will be more than 0.8 m which is considered as significant but in the present scenario all the villages of core zone and buffer zone considered for analysis shows decline less than 0.8 m over the period of four years, so it is evident that in there is a marginal decline in water level trend in pre-monsoon period over the period of four years (**Fig 5.4**).

Sn	Village	Mean pre- monsoon (May' 2011 - May 21) (mbgl)	Mean post- monsoon (Nov' 2011 -Nov 21) (mbgl)	DTW May' 2022 (mbgl)	DTW Nov 2022 (mbgl	Change(m) Pre- monsoon	Change (m) post- monsoon
			5 Km Radiu	JS			
1	Amlitalab	4.40	1.60	5.20	2.10	-0.80	-0.50
2	Bharuwadih khurd	10.43	5.68	11.20	5.30	-0.77	0.38

Table 5.2: Comparisons of water levels (2019-2021) with reference to water levels of the year 2022.

3	Chhataud	7.80	3.86	8.36	4.60	-0.56	-0.74
4	Chicholi	7.20	1.72	7.89	2.50	-0.69	-0.78
5	Deogaon	6.03	3.07	6.79	3.80	-0.76	-0.73
6	Dhansuli	3.30	1.28	3.78	2.00	-0.48	-0.72
7	Gaitara	6.30	2.25	6.84	2.90	-0.54	-0.65
8	Gourkheda	5.80	2.33	5.64	2.10	0.16	0.23
9	Khapri	4.70	1.70	4.90	2.50	-0.20	-0.80
10	Mohrenga	2.99	1.51	3.69	2.10	-0.70	-0.59
11	Mura	4.20	1.20	4.69	1.80	-0.49	-0.60
12	Paraswani	9.06	4.34	8.88	3.34	0.18	1.00
13	Raikheda	4.01	2.01	4.63	2.80	-0.62	-0.79
14	Sontara	6.50	3.08	6.70	3.80	-0.20	-0.72
15	Tarasiv	5.01	1.92	5.78	2.00	-0.77	-0.08
		I	10 KM Radi	us		L	
16	Bangoli	9.62	4.70	9.60	4.20	0.02	0.50
17	Bharuwadih kala	12.34	6.44	12.70	5.54	-0.36	0.90
18	Chhachhanpahri	9.80	4.30	10.60	4.90	-0.80	-0.60
19	Chhapora	6.80	3.68	7.56	3.45	-0.76	0.23
20	Janjgira	10.02	4.89	10.40	5.60	-0.38	-0.71
21	Kathiya	8.45	2.95	7.63	1.30	0.82	1.65
22	Keotara	8.22	3.74	8.03	4.50	0.19	-0.76
23	Kharora	5.90	1.80	6.35	2.50	-0.45	-0.70
24	Khauna	9.04	5.54	8.77	5.27	0.27	0.27
25	Kodwa	6.20	2.10	6.00	2.00	0.20	0.10
26	Konari	7.80	2.98	7.50	1.30	0.30	1.68
27	Kundru	9.70	4.80	9.80	4.60	-0.10	0.20
28	Kurra	11.05	5.91	11.47	5.61	-0.42	0.30
29	Math	4.55	1.65	5.12	2.00	-0.57	-0.35
30	Murdhpar	12.19	5.80	7.23	2.30	4.96	3.50
31	Nahardia	8.02	4.51	8.47	5.20	-0.45	-0.69
32	Nakti Khapri	12.01	6.90	12.60	7.70	-0.59	-0.80
33	Nilja	5.90	2.05	5.70	2.01	0.20	0.04
1			1			1	

34	Pikridih	6.89	1.91	7.56	2.70	-0.67	-0.79
35	Siwai	8.50	4.90	8.66	4.81	-0.16	0.09
36	Tildadih	5.80	2.05	5.71	2.80	0.09	-0.75



Fig 5.4 : Pre-monsoon water level change (May'2019-2021 Vs May'2022)





5.3.1.2 POST-MONSOON DEPTH TO WATER LEVEL TREND

While comparing mean post-monsoon average water levels of (2019-2021) with that of 2022 (Table 5.2), it is found that 80% the villages in core zone (5 Km Radius) which are considered for analysis showing decline in the range of -0.08 to -0.8 m. remaining 40% of wells are showing rising water level in the range of 0.23 to 1.0 m. 43% village are showing decline in water level of -0.35 to -0.8 m. and remaining 57% village are showing rise in water level of 0.04 to 3.5 m. (Fig 5.7, Fig 5.8 and Fig 5,9). The area showing falling trend more than 20 cm/yr are of considerable significance which is attributed to increase in draft in selective patches.

In conclusion, if the decline per year is more than 0.20 m then for the period of four years it will be more than 0.8 m which is considered as significant but in the present scenario all the villages of core zone and buffer zone considered for analysis shows decline less than 0.8 m over the period of four years, so it is evident that in there is a marginal decline in water level trend in post-monsoon period over the period of four years.









Overall, from the comparison of mean water levels of the year 2019 to 2021 with respect to the years 2022 in pre-monsoon period it is found that all the villages in core zone which are considered for analysis showing decline in the range of -0.2 to -0.8 m. except Gaukheda and Paraswani villages which are showing rise of water level in the ranges of 0.16 to 0.18 m and 57 % of the villages in buffer zone(10 Km Radius) are showing decline in range of -0.1 to -0.8 m while 43 % villages are showing rising in water level in the range of 0.02 to 4.96 m. In post-monsoon period, it is found that 80% the villages in core zone (5 Km Radius) which are considered for analysis showing decline in the range of 0.23 to 1.0 m.In Buffer zone abour 43% village are showing

decline in water level of -0.35 to -0.8 m. and remaining 57% village are showing rise in water level of 0.04 to 3.5 m. The area showing falling trend more than 20 cm/yr are of considerable significance which is attributed to increase in draft in selective patches.

In conclusion, if the decline per year is more than 0.20 m then for the period of four years it will be more than 0.8 m which is considered as significant but in the present scenario all the villages of core zone and buffer zone considered for analysis shows decline less than 0.8 m over the period of four years, so it is evident that in there is a marginal decline in water level trend in pre and post-monsoon period over the period of four years.

5.4 HYDROGRAPHS:

The variation in ground water level recorded systematically for a longer period can be plotted in the form of graph (hydrograph). This trend is also depicted from the individual hydrographs of monitoring stations. Some representative hydrographs are given below for core and buffer zone for the period of January'2019 to November'2022 in **Fig 5.10 to Fig 5.15.** These representative hydrographs presented here also shows the decline in water levels over the period of observation. The decline rate is more in core zone and comparatively low in buffer zone.





5.4 AQUIFER PARAMETERS:

The aquifer parameters are essentially required for the estimation of mine seepage as well as planning the ground water withdrawal for open cast mining. Accordingly, pumping test has been carried out for determination of aquifer parameters accurately. The aquifer parameters of study area covered by limestone are described below.

The transmissivity values of phreatic aquifer tapped in open well in general varies from 4 to 8.5 m^2/day while specific capacity ranges from 15 to 40 lpm/m/day. However, for deep aquifer the transmissivity ranges from 15-32 m²/day and at places it ranges up to 40 m²/day. The potential fractures for boreholes up to 100 mbgl depth in the area are recorded at various depths i.e. 40-45, 60-65, 75-80, 90-95 mbgl and are 4 to 5 in numbers.

To verify the aquifer parameters of the aquifer present in the area pumping test has been carried out on a private /public bore well at Raikeda and Mohrenga village (close to Project). The results and data interpretation is discussed below

Village	Raikheda
Block	Tilda
District	Raipur
State	Chattisgarh
Date	28/11/2019
Duration of test	1000 minutes
Capacity of pump	5 hp
Distance of OW from pump well	45 m.
Thickness of the aquifer	10
MP(magl)	0.8
SWL(mbmp)	6.5
Discharge(lps)	5

	Table 5.3: Pumping Data observation well										
Sl.no.	Time since pumping started	Tape Reading (m)		DTW (mbmp)	Draw Down	Remarks					
	(min)	Hold	Cut	(momp)	(m)						
1	1	20	13.50	6.50	0.00						
2	2	20	13.30	6.70	0.20						
3	3	20	13.10	6.90	0.40						
4	4	20	13.00	7.00	0.50						

5	5	20	12.95	7.05	0.55	
6	6	20	12.70	7.30	0.80	
7	7	20	12.55	7.45	0.95	
8	8	20	12.40	7.60	1.10	
9	9	20	12.20	7.80	1.30	
10	10	20	12.00	8.00	1.50	
11	12	20	11.60	8.40	1.90	
12	14	20	11.50	8.50	2.00	
13	16	20	11.20	8.80	2.30	
14	18	20	11.01	8.99	2.49	
15	20	20	10.80	9.20	2.70	
16	25	20	10.50	9.50	3.00	
17	30	20	10.20	9.80	3.30	
18	40	20	10.00	10.00	3.50	
19	50	20	9.68	10.32	3.82	
20	60	20	9.30	10.70	4.20	
21	80	20	9.10	10.90	4.40	
22	100	20	8.80	11.20	4.70	
23	200	20	8.30	11.70	5.20	
24	300	20	7.80	12.20	5.70	
25	400	20	7.50	12.50	6.00	
26	500	20	7.35	12.65	6.15	
27	600	20	7.22	12.78	6.28	
28	700	20	7.09	12.91	6.41	
29	800	20	7.00	13.00	6.50	
30	900	20	6.90	13.10	6.60	
31	1000	20	6.88	13.12	6.62	

The pumping test data has been analyzed by Jacob's straight line method of the pumping data of the observation well. The calculation is given below.

Formulae:

 $T=2.3Q/4\pi\Delta s$

K == T/b &

$$S = 2.25 T t_o/r^2$$

Where,

T =kD = Transmissivity, m²/day

K =Permeability

B= Thickness of aquifer

 $Q = Discharge m^3/day$

r = Distance (m) between PW & OW

 $\Delta s =$ Slope of straight line per log cycle of time

S = Storage coefficient

to= time in days at zero drawdown

On the basis of above formulae, the calculated parameters are as follows.

T= 30.42 m²/day, K=2.3765 m/day &

 $S = 7.041 \text{ X}10^{-5}$



	Table 5.3: Recuperation Data												
Time since	Time since	t/t'	Tape rea	ding (m)	DTW	RDD (m)	Remarks						
pumping started in	pumping stopped in		Hold	Cut	(mbmp)								
min(t)	min (t')												
1001	1	1001.00	20	6.88	13.12	6.62							
1002	2	501.00	20	7	13	6.5							

1003	3	334.33	20	7.1	12.9	6.4	
1004	4	251.00	20	7.29	12.71	6.21	
1005	5	201.00	20	7.4	12.6	6.1	
1006	6	167.67	20	7.5	12.5	6	
1007	7	143.86	20	7.66	12.34	5.84	
1008	8	126.00	20	7.89	12.11	5.61	
1009	9	112.11	16	4.1	11.9	5.4	
1010	10	101.00	16	4.5	11.5	5	
1020	20	51.00	16	5	11	4.5	
1030	30	34.33	16	5.6	10.4	3.9	
1040	40	26.00	16	5.8	10.2	3.7	
1050	50	21.00	16	6.2	9.8	3.3	
1060	60	17.67	16	6.6	9.4	2.9	
1070	70	15.29	16	6.99	9.01	2.51	
1080	80	13.50	16	7.18	8.82	2.32	
1090	90	12.11	16	7.1	8.9	2.4	
1100	100	11.00	16	7.3	8.7	2.2	
1200	200	6.00	16	8	8	1.5	
1300	300	4.33	16	8.4	7.6	1.1	
1400	400	3.50	16	8.64	7.36	0.86	
1500	500	3.00	16	8.8	7.2	0.7	
1600	600	2.67	16	8.9	7.1	0.6	
1700	700	2.43	16	9.05	6.95	0.45	
1800	800	2.25	16	9.18	6.82	0.32	
1900	900	2.11	16	9.26	6.74	0.24	
2000	1000	2.00	16	9.32	6.68	0.18	

Formulae:

T= 2.3Q/4 $\pi\Delta s$, K=T/b

On the basis of above formulae, the calculated parameters are as follows.

T= 30.42 m²/day, K=2.3765 m/day



t/ť(min)



Fig 5.4: Pumping water level data plot in Aquifer test soft ware

Village			Mohrenga		
Block			Tilda		
District			Raipur		
State			Chattisgarh		
Date			26-11-2022		
Duration	of test		300 minutes		
Capacity	of pump		3 hp		

|P a g e

Distance	of OW from	pump wel		30 m.				
Thickness	of the aqu	ifer		20				
MP(magl)				0.8				
SWL(mbn	np)			9				
Discharge	e(lps)			4.8				
	Pumpir	ng Data			Recupe	eration Da	ita	
Sl.no.	Time since pumping started (min)	DTW (mbmp)	Draw Down (m)	Time since pumping started in min(t)	Time since pumping stopped in min (t')	t/t'	DTW (mbmp)	RDD (m)
1	1	9.1	0.1	301	1	301	15.4	6.4
2	2	9.5	0.5	302	2	151	14.3	5.3
3	3	9.8	0.8	303	3	101	13.7	4.7
4	4	10	1	304	4	76	13.3	4.3
5	5	10.2	1.2	305	5	61	13.2	4.2
6	6	10.45	1.45	306	6	51	13	4
7	7	10.6	1.6	307	7	43.86	12.9	3.9
8	8	10.78	1.78	308	8	38.5	12.8	3.8
9	9	10.9	1.9	309	9	34.33	12.67	3.67
10	10	11	2	310	10	31	12.6	3.6
11	12	11.3	2.3	312	12	26	12.2	3.2
12	14	11.56	2.56	314	14	22.43	11.9	2.9
13	16	11.7	2.7	316	16	19.75	11.7	2.7
14	18	11.89	2.89	318	18	17.67	11.4	2.4
15	20	11.97	2.97	320	20	16	11.1	2.1
16	25	12.3	3.3	325	25	13	11	2
17	30	12.7	3.7	330	30	11	10.9	1.9
18	40	13	4	335	35	9.57	10.7	1.7
19	50	13.2	4.2	340	40	8.5	10.5	1.5
20	60	13.37	4.37	350	50	7	10.2	1.2
21	80	13.6	4.6	360	60	6	10	1
22	100	13.8	4.8	370	70	5.29	9.9	0.9
23	120	13.9	4.9	380	80	4.75	9.8	0.8
24	140	14	5	390	90	4.33	9.7	0.7
25	160	14.09	5.09	400	100	4	9.6	0.6
26	180	14.21	5.21	450	150	3	9.51	0.51
27	200	14.3	5.3	500	200	2.5	9.39	0.39
28	250	14.9	5.9	550	250	2.2	9.27	0.27
29	300	15.3	6.3	600	300	2	9.2	0.2

The pumping test data has been analyzed by Jacob's straight line method of the pumping data of the observation well. The calculation is given below.

Formulae: $T = 2.3Q/4\pi\Delta s$, K = = T/b & $S = 2.25 T t_o/r^2$

Where,

T =
$$kD$$
 = Transmissivity, m²/day, K =Permeability.D= Thickness of aquifer

 $Q = Discharge m^3/day$

r = Distance (m) between PW & OW

 Δs = Slope of straight line per log cycle of time

S = Storage coefficient

 $t_o = time in days at zero drawdown$

On the basis of above formulae, the calculated parameters are as follows.

T= 38.33 m²/day, K=1.91 m/day& S= 3.83 X10⁻⁵



Formulae:

T= 2.3Q/4 $\pi\Delta s$, K=T/b

On the basis of above formulae, the calculated parameters are as follows.

 $T=34.37 \text{ m}^2/\text{day}, K=1.718 \text{ m/day}$



6. SURFACE GEOPHYSICAL SURVEY

Surface geophysical survey comprised of Ten Vertical Electrical Sounding (VES) have been conducted at ten different locations after S1 during the period 01.07.2020 to 11.07.2020 & 10.11.2022 to 15.11.2022 to know the subsurface condition in parts of Tilda block, Raipur district, Raipur, Chhattisgarh. The VES location is given in Fig No: 6.1.

6.1 Resistivity Survey:

Using Ohm's law electrical resistivity of sub-surface geologic formation is determined through artificially energizing the subsurface and carrying measurements on the ground surface. Contrast in resistivity value of an individual layer with the surrounding or effective presence (dependent of its relative resistivity and thickness) makes it detectable.

In the electrical resistivity method, a known amount of electrical current (I) is sent into the ground through a pair of electrode (called current electrodes) and the potential (δV) developed because of the resistance offered by the subsurface due to the passage of this current is measured across another pair of electrodes (potential electrodes) planted into the ground. The ratio between the potential measured and the corresponding current sent into the ground yields the resistance 'R' of the ground to a depth depending upon the spacing between the two current electrodes. Through the multiplication of this value of 'R' by a geometric factor a parameter called the apparent resistivity " ρ_a " is computed. Both the parameters, apparent resistivity ' ρ_a ' and the resistance 'R' contain the information on the geoelectric characteristics of the subsurface. In practice, there exist several configurations but most commonly used are the Wenner and Schlumberger configurations.

In this survey microprocessor based resistivity meter CRM-500 was used. For the present study Vertical Electrical Sounding (VES) have been carried out using Schlumberger configuration.Maximum spreads were 200m (AB) for sounding.

6.2 Vertical Electrical Sounding (VES)

VES is a process by which the depth investigation is made. In this, the center is fixed and the measurements are made by successively increasing the electrode spacing. The apparent resistivity values obtained with increasing values of electrode separations are used to estimate the thickness and resistivity's of the subsurface formations. In Schlumberger sounding arrangement (Figure-6), all the four electrodes are kept in a line symmetrically over a point '0', with inner (Potential) electrodes kept closer. For increasing the depth of investigation the current electrodes C_1 and C_2 are moved apart

symmetrically from the centre point '0' keeping the potential electrodes fixed. The separation between the potential electrodes is changed only when the potential between them drops to allow value during the course of sounding. The apparent resistivity for each electrode separation is calculated by multiplying the resistance 'R' with Schlumberger configuration factor 'K' (which is called as geometrical factor).



Fig 6.2 (A): Schlumberger electrode configuration

The formula is: $\rho_a = \pi R \{ (C_1 C_2 / 2)^2 - (P_1 P_2 / 2)^2 \} / P_1 P_2 \text{ or } \rho_a = KR$

Where 'K' is the geometric factor for Schlumberger configuration,

C₁C₂ is current electrode spacing

P₁P₂ is potential electrode spacing

Equipment

The geophysical methods are useful in constructing a picture of the subsurface hydrogeological conditions in totally virgin areas. It is based upon measurement of earth electrical properties. In the present study the resistivity surveys have been carried out by using Aquameter CRM 500 an indigenous microprocessor based Resistivity Meter (Fig.-6.2 B).

Aquameter CRM 500 is a high power version (40 Watt) which is useful for any type of soil specially preferred for low resistivity soil of the coastal region. It can penetrate current down to 500 meters. It is

a popular instrument, because of its single button operation deep penetration, accurate and reliable result, even in adverse field conditions. The instrument has a facility to measure self-potential (SP) which is useful in mineral prospecting and environmental studies.

Fig 6.2 (B): Aquameter CRM 500





6.3 Data Analysis and Interpretation

Surface geophysical survey comprised of nine Vertical Electrical Sounding (VES) has been conducted at ten different locations during the period 01.07.2020 to 11.07.2020 & 10.11.2022 to 15.11.2022 to identify the subsurface condition of the study area. The observed resistance values from the instrument have been multiplied with geometric factor (K) to get the apparent resistivity values for each electrode spacing. The apparent resistivity values for different potential dipole were brought to single common potential dipole. The field apparent resistivity data were plotted on log-log graph paper against the half current electrode separation to get the VES curves (X axis- $C_1C_2/2$ value and Y axis apparent resistivity value).

These data of $C_1C_2/2$ and apparent resistivity were interpreted with the help of two layer master curve by curve matching technique and further checked with the help of IPI2WIN software. The final results were corroborated with the known hydrogeological conditions existing in the area. The geoelectric layer parameters (layer resistivity and layer thickness) were obtained for each VES. The interpreted results are given in the table 6.3.The field curves of VES are given in Fig 6.3, 6.4, 6.5 6.12 and the field data of VES are shown in Table 6.1 and 6.2.

6.4 Discussion of result

A total 15 numbers of VES has been carried out at various villages of the study area (Details of locations is given in fig.6.1). Aquameter CRM 500 Resistivity meter has been used for conducting the VES. Schlumberger and half Schlumberger configurations have been used for conducting the VES survey. The maximum current electrode spread for conducting VES was 240m (AB). Location of VES points are given below in fig.-6.1.

The data is plotted on double logarithmic graph paper and matched with standard curves to know the true resistivity and thickness of various layers. The data is also interpreted by Computer using IPI2WIN software to verify the results of partial curve matching. From interpreted results of VES the resistivity and thickness of different layers are given in table 6.3.

VES-1:

It is a HA type curve and it has four layer. The topmost layer having resistivity value of 112 Ω -m may be laterite whereas the second layer may be weathered limestone with resistivity of 23.5 Ω -m. The third layer may be fractured limestone with resistivity of 110 Ω -m while, the last layer may be massive limestone having resistivity of 1405 Ω -m. The thickness of topmost layer was1.7 m and the second layer & third layer thickness were 5.4 and 4.8 m respectively.

VES-2:

It is also a HA type curve and it has four layer. The topmost layer having resistivity value of 50 Ω -m may be top soil whereas the second layer may be weathered limestone with resistivity of 10.5 Ω -m. The third layer may be highly fractured limestone with resistivity of 28 Ω -m while, the last layer may be massive limestone having resistivity of 235 Ω -m. The thickness of topmost layer was1.5 m and the second layer & third layer thickness were 18 and 16 m respectively.

VES-3:

It is also a HA type curve and it has four layer. The topmost layer having resistivity value of 215 Ω -m is lateritic soil whereas the second layer is weathered limestone with resistivity of 30 Ω -m. The third layer may be fractured limestone with resistivity of 125 Ω -m while, the last layer may be massive limestone having resistivity of 550 Ω -m. The thickness of topmost layer is 2.1 m and the second layer & third layer thickness were 14.3 and 10.4 m respectively.

VES-4:

It is a QH type curve and it has four layers. The topmost layer having resistivity value of 175Ω -m is lateritic soil whereas the second layer is weathered limestone with resistivity of 62 Ω -m. The third layer may be highly fractured limestone with resistivity of 16.5 Ω -m while, the last layer may be massive limestone having resistivity of 175 Ω -m. The thickness of topmost layer is 1.3 m and the second layer & third layer thickness were 5 and 32 m respectively.

VES-5:

It is also a QH type curve and it has four layer. The topmost layer having resistivity value of 170 Ω -m is lateritic soil whereas the second layer is weathered limestone with resistivity of 30 Ω -m. The third layer may be highly fractured limestone with resistivity of 14 Ω -m while, the last layer may be massive limestone having resistivity of 165 Ω -m. The thickness of topmost layer is 1.5 m and the second layer & third layer thickness were 4 and 16.5 m respectively.

VES-6:

It is also a QH type curve and it has four layers. The topmost layer having resistivity value of 105 Ω -m is lateritic soil whereas the second layer is weathered limestone with resistivity of 23 Ω -m. The third layer may be highly fractured limestone with resistivity of 13 Ω -m while, the last layer may be massive limestone having resistivity of 105 Ω -m. The thickness of topmost layer is 1.8 m and the second layer & third layer thickness were 2 and 18 m respectively.

VES-7:

It is also a QH type curve and it has four layers. The topmost layer having resistivity value of 245 Ω -m is lateritic soil whereas the second layer is weathered limestone with resistivity of 78 Ω -m. The third layer may be highly fractured limestone with resistivity of 19 Ω -m while, the last layer may be massive limestone having resistivity of 220 Ω -m. The thickness of topmost layer is 1.8 m and the second layer & third layer thickness were 3.5 and 16 m respectively.

VES-8:

It is a HA type curve and it has four layer. The topmost layer having resistivity value of 115 Ω -m is lateritic soil whereas the second layer is weathered limestone with resistivity of 17 Ω -m. The third layer may be fractured limestone with resistivity of 120 Ω -m while, the last layer may be massive limestone having resistivity of 285 Ω -m. The thickness of topmost layer is 1.5 m and the second layer & third layer thickness were 8.5 and 11.3 m respectively.

VES-9:

It is also a HA type curve and it has four layer. The topmost layer having resistivity value of 50 Ω -m is top soil whereas the second layer is weathered limestone with resistivity of 22.5 Ω -m. The third layer may be fractured limestone with resistivity of 30 Ω -m while, the last layer may be limestone having resistivity of 65 Ω -m. The thickness of topmost layer is 1.3 m and the second layer & third layer thickness were 10.6 and 21.2 m respectively.

VES-10:

It is also a QH type curve and it has four layers. The topmost layer having resistivity value of 75 Ω -m is lateritic soil whereas the second layer is weathered limestone with resistivity of 38 Ω -m. The third layer may be highly fractured limestone with resistivity of 12.5 Ω -m while, the last layer may be massive limestone having resistivity of 160 Ω -m. The thickness of topmost layer is 2.8 m and the second layer & third layer thickness were 2.5 and 8.2 m respectively.

6.5 Conclusions & Recommendations

From the interpretation of resistivity survey we got the following outcome.

The thickness of lateritic topsoil varies from 1.3 meter to 2.8 meters with resistivity range from 50 Ω -m to 245 Ω -m.

The thickness of weathered formation varies from 2.0 meter to 14.3 meters and the resistivity range is 10.5Ω -m to 78 Ω -m.

Third layer mostly indicates fracture zones and the thickness of this layer varies from 4.8 meters to 23.2 meters and resistivity range is 13Ω -m to 125Ω -m.

The last layer is massive formation which shows high electrical resistivity with the range of 65 Ω -m to 550 Ω -m.

				Table-6	.1: VES Da	ata			
VI	ES 1	VI	ES 2	VI	ES 3	V	ES 4	1	VES 5
Loc	ation:	Loca	ation:	Loc	ation:	Loc	cation:	Lo	ocation:
М	ura	Chi	choli	Ba	rtori	Та	rsiva	Ba	ronda
Lati	itude:	Lati	tude:	Lati	Latitude:		titude:	L	atitude:
N21°2	N21°26' 17.52"		N21°27' 46.93"		N 21° 29' 27.83"		N 21° 28' 35.50"		23' 04.37"
Long	gitude:	Long	gitude:	Long	gitude:	Longitude:		Lo	ngitude:
E 81° 5	2' 04.72"	E 81° 5	2' 19.08"	E 81° 4	8' 29.82"	E 81° 51' 08.38"		E 81°	49' 37.50"
D	ate:	D	ate:	D	ate:	Γ	Date:		Date:
Altitud	e: 303 m	Altitud	e: 314m	Altitud	le: 299m	Altitude: 310m		Altit	ude: 286m
AB/2	App. R	AB/2	App. R	AB/2	App. R	AB/2	App. R	AB/2	App. R
2	98.69	2	37.57	2	205.53	2	268.75	2	224.69
3	74.32	3	34.38	3	153.85	3	179.55	3	174.34
4	58.50	4	26.14	4	121.97	4	127.57	4	131.31
5	47.81	5	19.52	5	94.65	5	92.70	5	102.46
6	38.02	6	15.49	6	76.03	6	70.40	6	76.03
8	32.60	8	12.54	8	52.67	8	45.14	8	42.64
10	35.30	10	11.77	10	43.14	10	62.76	10	23.53
12	39.68	12	11.70	12	35.78	12	47.75	12	15.25
14	44.12	14	11.77	14	35.53	14	36.38	14	11.77
16	48.26	16	11.23	16	33.31	16	31.04	16	10.30

18	53.93	18	12.48	18	36.66	18	30.31	18	11.77
20	57.64	20	11.03	20	38.38	20	26.26	20	12.94
25	66.60	25	13.84	25	49.25	25	23.53	25	15.65
30	68.64	30	14.98	30	55.27	30	16.98	30	18.91
35	77.90	35	15.40	35	67.37	35	19.62	35	23.34
40	80.94	40	16.85	40	77.37	40	21.39	40	26.26
45	81.14	45	18.40	45	77.20	45	22.17	45	27.79
50	80.33	50	20.12	50	86.85	50	24.70	50	30.57
60	96.70	60	23.71	60	112.90	60	24.77	60	40.84
70	92.30	70	27.12	70	119.75	70	31.08	70	46.66
80	94.23	80	30.40	80	136.21	80	34.26	80	52.90
90	102.56	90	34.84	90	159.66	90	37.29	90	60.10
100	116.34	100	38.45	100	148.19	100	41.02	100	67.08
			1	able-6.	2: VES Da	ita			
VI	ES 6	VI	ES 7	1	ES 8		VES 9		VES 10
Loca	ation:	Loc	ation:	Lo	cation:	I	Location:	L	ocation:
Rail	cheda	Μ	ath	Se	ontara	Р	lant Area	Pl	ant Area
						(Pu	mp House) (Gos	han Area)
Lati	tude:	Lati	tude:	La	Latitude:		Latitude:	I	atitude:
N 21° 2	7' 19.50"	N 21° 2	3' 44.91"	N 21°	27' 15.25"	N 2	1° 27' 10.55"	N 21	° 27' 15.19'
Long	gitude:	Long	gitude:	Loi	ngitude:	I	ongitude:	Lo	ongitude:
E 81° 5	0' 20.11"	E 81° 5	3' 14.98"	E 81°	49' 20.11'	E 8	l° 51' 50.69"	E 81	° 50' 43.66"
D	ate:	D	ate:]	Date:		Date:		Date:
Altitud	e: 311m	Altitud	e: 302m	Altitu	ıde: 301m	Alt	itude: 305m	Alti	tude: 308m
AB/2	App.	AB/2	App.	AB/2	App.	AB	2 App.	AB/2	2 App. R
2	171.12	2	211.86	2	232.99	2	33.80	0 2	72.88
2 3	171.12 134.06	2 3	211.86 169.14	2 3	232.99	2 3	33.80 26.74	D 2 4 3	72.88 69.46
2 3 4	171.12 134.06 102.06	2 3 4	211.86 169.14 143.13	2 3 4	232.99 143.43 98.95	$\begin{array}{c c} \hline 2 \\ \hline 3 \\ \hline 4 \\ \hline \end{array}$	33.80 26.74 25.5	D 2 4 3 1 4	72.88 69.46 67.83
2 3 4 5	171.12 134.06 102.06 72.21	2 3 4 5	211.86 169.14 143.13 121.00	2 3 4 5	232.99 143.43 98.95 63.43	2 3 3 4 5	33.80 26.74 25.5 24.40	D 2 4 3 1 4 0 5	72.88 69.46 67.83 58.55
2 3 4 5 6	171.12 134.06 102.06 72.21 50.69	2 3 4 5 6	211.86 169.14 143.13 121.00 101.38	2 3 4 5 6	232.99 143.43 98.95 63.43 45.06	2 3 3 4 5 6 6	33.80 26.74 25.5 24.40 25.34	D 2 4 3 1 4 0 5 4 6	72.88 69.46 67.83 58.55 52.10
2 3 4 5 6 8	171.12 171.12 134.06 102.06 72.21 50.69 27.59	2 3 4 5 6 8	211.86 169.14 143.13 121.00 101.38 67.72	2 3 4 5 6 8	232.99 143.43 98.95 63.43 45.06 35.11	2 3 3 4 5 6 8	33.80 26.74 25.5 24.40 25.34 27.59	D 2 4 3 1 4 0 5 4 6 9 8	72.88 69.46 67.83 58.55 52.10 40.13
2 3 4 5 6 8 10	171.12 134.06 102.06 72.21 50.69 27.59 19.61	2 3 4 5 6 8 10	211.86 169.14 143.13 121.00 101.38 67.72 50.99	2 3 4 5 6 8 10	232.99 143.43 98.95 63.43 45.06 35.11 39.22	$ \begin{array}{c c} 2 \\ 2 \\ $	33.80 26.74 25.5 24.40 25.34 27.59 27.40	D 2 4 3 1 4 0 5 4 6 9 8 6 10	72.88 69.46 67.83 58.55 52.10 40.13 35.30

12	14.79	12	36.15	12	37.01	12	26.69	12	28.96
14	16.23	14	28.33	14	41.53	14	28.29	14	26.47
16	15.98	16	24.17	16	45.42	16	28.39	16	25.10
18	14.88	18	21.24	18	49.99	18	33.28	18	26.96
20	17.02	20	21.32	20	57.10	20	30.33	20	27.30
25	19.25	25	23.82	25	59.70	25	25.21	25	28.54
30	20.20	30	28.42	30	79.67	30	26.08	30	34.32
35	20.52	35	31.89	35	84.98	35	27.18	35	39.22
40	22.44	40	36.74	40	97.20	40	26.76	40	41.18
45	23.94	45	43.11	45	101.17	45	26.83	45	45.76
50	25.39	50	48.23	50	116.43	50	28.03	50	48.53
60	29.54	60	59.11	60	133.82	60	28.77	60	58.42
70	34.73	70	69.09	70	157.82	70	29.06	70	63.73
80	36.15	80	81.91	80	177.55	80	30.16	80	62.74
90	39.92	90	91.63	90	201.04	90	32.67	90	66.39
100	11 10	100	101 12	100	200.26	100	22.40	100	(5.70)

Table-6.3: Interpreted Results of VES											
VES	La	yer Resistiv	ity(in Ohm	Layer Thickness(in m)							
No	ρ1	ρ ₂	ρ ₃	ρ4	h ₁	h ₂	h ₃				
VES-1	112	23.5	110	140	1.7	5.4	4.8				
VES-2	50	10.5	28	235	1.5	18.0	16.0				
VES-3	215	30	125	550	2.1	14.3	10.4				
VES-4	175	62	16.5	175	1.3	5.0	32.0				
VES-5	170	30	14	165	1.5	4.0	16.5				
VES-6	105	23	13	105	1.8	2.0	18.0				
VES-7	245	78	19	220	1.8	3.5	16.0				
VES-8	115	17	120	285	1.5	8.5	11.3				
VES-9	50	22.5	30	65	1.3	10.6	21.2				
VES-10	75	38	12.5	160	2.8	2.5	8.2				





Fig-6.4:VES Curve and interpreted results at Chicholi (VES 2)

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Fig 6.7: VES Curve and interpreted results at Baronda - (VES 5)



Fig-6.8: VES Curve and interpreted results at Raikheda - (VES 6)



Fig-6.9: VES Curve and interpreted results at Math(VES 7)





Fig-6.10: VES Curve and interpreted results at Sontara(VES8)





Fig-6.12: VES Curve and interpreted results at Plant Area (Goshan Area) (VES10)

FIG 6.13: PHOTOGRAPHS OF GEOPHYSICAL SURVEY IN VARIOUS VILLAGES IN STUDY AREA















7. GROUND WATER RESOURCES

The ground water resources for the study area were assessed as per methodology recommended by ground water estimation committee'2015. The resources were calculated by Infiltration method due to non-availability of long term water level data and fluctuation in the area. The rain fall recharge was calculated by Rainfall Infiltration method. Domestic water requirement has been estimated based on population as per Census 2011 by taking the average per capita consumption as 60 liter per day by considering 100% dependence of total population on ground water. The ground water draft for irrigation was calculated from number of ground water abstraction structure.

7.1: GROUND WATER RECHARGE:

- **a**) Total geographical area in ha. = 31400
- **b**) Area not suitable for ground recharge in ha. =Nil
- c) Area suitable for ground recharge in ha. =31400
- d) Average water level:

Pre-monsoon = 6.81 mbgl.

Post-monsoon = 1.88mbgl.

- e) Normal annual rain fall = 1.04 m.
- f) Normal monsoon rain fall = 0.88 m.
- **g**) Normal non monsoon rain fall = 0.16 m
- h) Ground Water Recharge by rain fall infiltration method The rain fall infiltration factors for different formations have been taken as those recommended by GEC 2015. The equation used for computation of recharge is

 $R_{rf} = NAR \times A \times RFI$

Where,

R_{rf}= Recharge from rainfall

NAR = Normal annual rain fall

A = Area of the unit in ha

RIF = Rain fall infiltration factor

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Recharge from rainfall = $1.04 \times 31400 \times 0.06$

= 1959.36 ham.

Return seepage from surface water irrigation

Crop type	Area irrigated (ha)	Average depth of water applied (m)	Irrigation water applied (ham)	Water delivered at 80%efficiency	Seepage factor	Seepage (ham)
Paddy	3239	0.4	1295.6	1619.5	0.4	647.8

i) Seepage from tanks/ ponds

No of tanks = 278

Total water spreaded area in ha = 1570

Seepage factor (m/year) = 0.6

Total non monsoon seepage (ham) = 942

j) Annual ground water recharge =

Rainfall recharge + Seepage from irrigation + Recharge from tanks/ponds

= 1959.36 + 647.8 + 942

= 3549.16 ham

K) Annual Extractable Ground Water Recharge

Annual Extractable Ground Water Rechargehas been computed by deducting the unaccounted natural discharge from the total annual recharge as per the criteria recommended by GEC'2015. In the study area 10% of replenishable ground water is considered to deduct from total recharge as it goes as base flow.

Annual Extractable Ground Water Recharge= Total annual recharge- Base flow

= 3549.16 ham - 354.9 ham

= 3194.26 ham

7.2: ANNUAL GROUND WATER EXTRACTION:

7.2.1: Domestic purposes:

Water draft has been estimated based on population. The average per capita consumption has been taken as 60 liters per day by considering 100% dependence on the ground water. The total annual demand is calculated as follows

Total annual demand in ham = Population \times 60 \times 365 /1000 \times 1000

 $= 90074 \times 60 \times 365 \ / \ 1000 \times 1000$

= 197.26 ham

7.2.2: Ground water draft for irrigation:

Ground water draft for irrigation was calculated from number of ground water abstraction structures present in the area.

Ground water structure	No of G W structure	Unit draft in ham	Gross extraction
			in ham
Dug wells	520	1.0	520
Tube wells	500	2.0	1000

7.3: Ground water balance (ham) :

= Annual Extractable Ground Water Recharge – Gross ground water extraction

= 3194.26 ham-1717.26 ham

= 1477.0 ham

From the above it may be seen that the balance ground water resources in the area is of the order of 1477 ham

7.4: Stage of ground water Extraction:

= Gross ground water extraction \times 100/Annual extractable ground water recharge

= 1717.26 *100/3194.26= **53.76 %**

According to recommended methodology stage of ground water extraction below 70% is considered safe under all circumstances whereas stage of extraction up to 90% is considered safe, if the long-term water levels do not show any declining trends. So the present study area is come in "SAFE" category.

8. ARTIFICIAL RECHARGE AND RAIN WATER HARVESTING

Artificial recharge to ground water through scientifically designed structures has been proven as a viable option for augmentation of ground water resources. It also provides an opportunity to utilize the surplus monsoon run-off which otherwise lost to sea unutilized.

Artificial recharge aims at augmenting the natural replenishment of ground water storage by some method of construction, spreading of water, or by artificially changing natural conditions. It is useful for reducing overdraft, conserving surface run-off, and increasing available ground water supplies. Recharge may be incidental or deliberate, depending on whether or not it is a by-product of normal water utilization. Artificial recharge is becoming increasingly necessary to ensure sustainable ground water supplies to satisfy the needs of a multi-pronged demand. The benefits of artificial recharge can be both tangible and intangible.

The concept of rainwater harvesting involves 'tapping the rainwater where it falls'. A major portion of rainwater that falls on the earth's surface runs off into streams and rivers and finally into the sea. The technique of rainwater harvesting involves collecting the rain from localized catchment surfaces such as roofs, plain/sloping surfaces etc., either for direct use or to augment the ground water resources depending on local conditions. Construction of small barriers across small streams to check and store the running water also can be considered as water harvesting.

During monsoon season, whatever rainwater is collected in the premises of project area, i.e. through, Building/roof area, Road/Paved area, Green belt area and Open land will be utilized to recharge the ground water. It is proposed to implement rain water harvesting structures at feasible, viable and sustainable location, catchment wise by diverting the runoff that is generated from the roof area, paved area, roads and green belt area for recharging into the specified recharge structure for putting into ground water system. The runoff generated from the two catchments needs to be suitably diverted through storm water drains to the recharge structures in order to augment the ground water. Overflow water from recharge structures is to be stored into two proposed ponds to be constructed at the western fringe of the plant area as a water conservation measures. Special care needs to be taken for locating the recharge structures and water conservation storage ponds so that the ground water augmentation as well as conservation is optimal. Implementation of water conservation structures and recharge mechanism shall ensure the balance between the discharge vis-à-vis recharge relationships of the aquifer system and provide the sustainable ground water supply. Based on the site plan and the land use pattern of the project area, the computation of runoff for each unit has been worked out and the details are tabulated below.

Total Area available for recharge – 3439950 sq.m.

Rainfall – 1145 mm. (60-65 rainy days)

Formations –Laterite and Limestrone.

A. Runoff Available for Recharge:

S. N.	Land use type	Area (m ²)	Rainfall (m)	Amount of water that received Through Rain (Cub meter)	Co- efficient of runoff	Quantity of Rainwater (m ³)		
1.	Building/ sheds	1719975	1.14	1960771.5	0.85	1666655.77		
2.	Green belt area Approx.	1133160	1.14	1291802.4	0.15	193770.36		
3.	Open land area	343995	1.14	392154.3	0.20	78430.86		
4.	Road area	242820	1.14	276814.8	0.65	179929.62		
5.	Total Area	3439950				2118786.61		
6.	Assuming 10% is not Suitable for recharge, hence available quantum of Rain water for Recharge is about 1906907.95m³ [90% 2118786.61 m³]							

From the above, it is observed that a total potential of **1906907.95** cum of rainfall runoff can be harvested at feasible, viable and sustainable location annually.

B. Estimation of Peak Rain fall Runoff:

Sr. No.	Type of land-use	Area [in m ²]	Peak Rainfall [in m/ hour]	Coefficient of runoff	Rain water collected [in m ³ / hour]	Runoff for 15 min peak intensity (Cu.Mtr)		
1.	Building/ sheds	1719975	0.035	0.85	51169.25	12792.31		
2.	Green belt area	1133160	0.035	0.15	5949.09	1487.27		
3.	Open land area	343995	0.035	0.20	2407.96	601.99		
4.	Road area	242820	0.035	0.65	5524.15	1381.03		
5.	Total Area	3439950				16262.6		
6.	Assuming 10% is not suitable for recharge, hence available quantum of Rain water for recharge is about 14636.34 m³ [90% of 16262.6 m³]							

Details of Rain water Harvesting Structure Implemented in plant Premises:

Sl No	Name of Structure	Length (In Mtr)	Width (In Mtr)	Depth (In Mtr)	Total Area (In M ³)
1	Recharge Pond	70	55	10	38500
2	Recharge Pond	48	46	10	22080

Total recharge potential is received from plant premises is diverted to Recharge pond to recharge the ground water level in the plant premises.

Plant Complex area:

The main interest in rainwater harvesting methods is the collecting and conserving rainwater at an early stage in the water cycle to ensure the best use of rainfall before it runs away into rivers and groundwater, or disappears as evaporation. The appropriate choice of rainwater harvesting and artificial recharge techniques depends on the amount of rainfall and its distribution, land topography, soil type, vadose zone thickness and its hydraulic characteristics, depth and type of aquifers, hydraulic parameters of aquifer systems, source and quality of recharge water, and socio-economic factors, among others; these factors tend to be location specific.

Thus, the selection of water harvesting structures and artificial recharge methods strongly depends on local conditions, which calls for proper scientific investigations prior to the design and execution of artificial recharge and/or rainwater harvesting schemes. Water harvesting methods include such widely differing practices as 'roof top water harvesting', 'land surface water harvesting' and 'groundwater harvesting'. On the other hand, a variety of methods have been developed to artificially recharge groundwater and mostly of combinations of direct surface, direct subsurface or indirect recharge techniques. Commonly used artificial recharge techniques, however, are through drainage canals, from surface water bodies like ponds and lakes, recharge through pits/shafts and tube wells/ bore wells etc.

The increasing stress on ground water needs, preventive measures like rain water harvesting structures and recharge measures are to be taken. It has been found that the plant areas of M/S Raipur Energen Limited offers enough scope and options for rain water harvesting and recharge measures. In view of this, detailed topographical, hydro-geological and hydrological study has been undertaken in the area, so as to formulate a comprehensive recharge plan outlining measures with recommended site specific designs for rain water conservation and recharge measures along with the implementing modalities.

Since, the selection and design of artificial recharge and water harvesting structures are highly dependent on the local feasible and suitable conditions and the availability of local materials for their construction. A successful design of artificial recharge and rain water harvesting structures necessitates proper understanding of hydrology and hydro-geology of the project area.

percolation pits may be with dimension as 1 m (length) x 1 m (width) x 2 m (depth) with 8" dia. injection well of 90 m depth having 8" plain pipe up to 6 m depth Thereafter, 7" dia. necked borehole

in rock may be made up to 84 m depth by DTH drilling machine. Each structure made at minimum spacing of 100 m may be made capable of recharging 195 m^3 /day by each pit. The inlet of the structure may be kept 1 m above pond bed leaving, 1 m water column for settlement of silt/dust etc. The annual cleaning/ removal of silt/ dust from the pond bed are suggested before monsoon for efficient working of system. We have already two no's of Recharge pond to recharge the ground water of the study area.

Photographs of Rain water harvesting Structure in Plant Premises:





RECHARGE PIT: On the bed of recharge pit of 1.5m x 1.5m x1.50m will be constructed as per design of pit given in **Figure 8.1.**





Fig 8.1 Recharge pit with bore well

BOREWELLDESIGN:

The depth of each new bore well will be 90m. The depth of bore well will be 90m below ground level and one meter above ground level that is pit bed. The diameter of bore well will be 150 mm. The cased portion will be top 06 meter and remaining 84 m will be uncase filled with gravel.

The casing of bore wells are slotted down to the depth of 6.00 m. the upper portion of casing above bottom of recharge pit is only 1.00m. This portion will be circumference with coir rope so that entry of fine sand and sl it can be avoided. The top of casing should be capped with stain less steel wire mesh so that clear water can be recharged directly without any floating particle. The relevant design is placed **Figure 8.2**



Fig 8.2: Bore well design

COVER TO RECHARGE PIT:

The cover for recharge pit is essential. The rain water harvesting is proposed to catch monsoon months. The recharge pit cover also safe guards the external pollutant like leaf and other local material. It is strongly recommend covering recharge pit by concrete slab with perforation. The design of recharge pit cover is exhibited in design at **Figure No 8.3**.



Fig 8.3 Design of recharge pit cover

SIDEWELLOFRECHARGEPIT:

The all four side wall of recharge pit will be perforated down to the depth of 0.50 m from top. The area occupied by perforated portion is in clear water above filter media filling. The design of recharge pit wall is given in **Figure8.4**



Fig 8.4 Perforation in side wall of recharge pit

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9. GROUND WATER QUALITY

The suitability of ground water for drinking/irrigation/industrial purposes is determined keeping in view the effects of various chemical constituents present in water on the growth of human being, animals, and various plants and also on industrial requirement. However, many ions are very essential for the growth of plants and human body but when present in excess, have an adverse effect on health and growth. For estimation of the quality of ground water, 15 ground water & Surface Water samples have been collected from 10 k.m. radius area. The ground water samples were analyzed for major as well as heavy chemical constituents. The ranges of different chemical constituents present in ground water are given in Table 9.1 and details are given in **Annexure I** and location of water sampling is given in **fig 9.1**.

SN	Parameters	Prescribed limits as per IS 10500 2012		Observed value	9
		Desirable limit	Permissible limit	Min	Max
1	PH Value	6.5-8.5	No relaxation	6.98	7.98
2	Turbidity (NTU)	1	5	0.22	6.3
3	Total Disolved Solid (mg/l)	500	2000	100	700
4	Total Hardness (as Caco3) (mg/l)	200	600	108	512
5	Calcium (Ca) (mg/l)	75	200	33.66	147.49
6	magnesium (As mg) (mg/l)	30	100	0.97	58.32
7	chloride (As Cl) (mg/l)	250	1000	20.27	141.94
8	Fluride (as F) (mg/l)	1	1.5	0.05	2.98
9	Sulphate as So4	200	400	3	115
10	Iron as Fe	0.3	No relaxation	<0.1	0.03
11	Nitrate (As No3) (mg/l)	45	No relaxation	<1	2.2
12	Sodium (Na) (mg/l)			4	28
13	Potasium (K) (mg/l)			1	12

 Table 9.1: Aquifer wise ranges of chemical constituents

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SN	Parameters	Prescribed limits 2012	s as per IS 10500	Observed value		
		Desirable limit	Permissible limit	Min	Max	
14	manganese as Mn	0.1	0.3	<0.1	<0.1	
15	Barium as Br	0.7	No relaxation	<0.7	<0.7	
16	Copper (as Cu) (mg/l)	0.05	1.5	<0.05	<0.05	
17	Aluminium as Al	0.03	0.2	<0.03	<0.03	
18	Lead as Pb	0.01	No relaxation	<0.01	<0.01	
19	Silver as Ag	0.1	No relaxation	<0.1	<0.1	
20	Boron as B			<0.1	<0.1	
21	Arsenic as As			<0.1	<0.1	
22	Chromium as Cr			<0.1	<0.1	
23	Carbonate Hardness			27.306	235.06	
24	Bi-carbonate as Hardness			40.262	349.72	

According to above table, majority of chemical constituent of all samples are within permissible limit and suitable for drinking, irrigation and industrial use, fluoride contamination is observed only at Bottom Ash Pond 02, Plant Area may be due to ash, and Iron concentration is slightly higher in all sample due to leaching of iron from laterite. Higher concentration of Mn observed at Mohrenga village and Mg contamination observed at Mura. Rest of the parameters is within permissible limit.



Fig-9.1: Location of water sampling

9.1 GEOCHEMICAL CLASSIFICATION OF GROUND WATER

The geochemical classification of ground water, of study area has been carried out by using Piper Diagrams the ground water is of Ca/Mg/Na-HCO₃ Cl type. The analysis of ground water samples collected from the area suggests that type of water in the major part is bicarbonate dominating type, **Table 9.2.** The type of ground water found in each ground water sample collected is given in the **Table 9.2**.

S.	Sample	Village	Х	Y	Elevation	Water Type
IN	ID	Peservoir Pond			(III(asi)	
1	SW1	Reservoir I ond	81.86806	21.45194	295	Ca-HCO3-Cl
		01				
2	SW2	Reservoir Pond 2	81.86194	21.45027	296	Mg-Ca-HCO3-Cl
3	SW3	Ash pond 01	81.86222	21.45028	298	Ca-Mg-HCO3-Cl
4	SW4	Ash pond 02	81.86195	21.44639	299	Ca-Mg-Cl-HCO3-SO4
5	SW5	Fly Ash Pond	81.86056	21.44333	293	Ca-Mg-Cl-SO4
6	SW6	Raikheda	81.83593	21.44197	290	Ca-Mg-HCO3
7	SW7	Chicholi	81.8606	21.4664	310	Ca-Mg-HCO3-Cl
8	SW8	Dhansuli	81.83915	21.41056	276	Ca-Mg-HCO3
9	SW9	Gaitara	81.84848	21.45809	300	Mg-Ca-HCO3
10	SW10	Nakti Khapri	81.78195	21.49554	299	Ca-Mg-Cl-HCO3
11	SW11	Kharora	81.92344	21.39763	304	Ca-Mg-HCO3-Cl
12	SW12	Kodwa	81.79152	21.45681	283	Ca-Mg-HCO3
13	SW13	Mohrenga	81.88416	21.43777	300	Ca-Mg-HCO3-Cl
14	SW14	Mudhpar	81.87262	21.37294	292	Ca-Cl-HCO3
15	SW15	MURA	81.86354	21.42523	292	Mg-Ca-HCO3-Cl

Table 9.2: The type of ground water

9.2 SUITABILITY OF GROUND WATER FOR DRINKING AND IRRIGATION PURPOSE

9.2.1 The suitability of ground water for drinking purpose

The suitability of ground water for drinking purpose is determined keeping in view the effects of various chemical constituents present in water on the biological system of human being. The standards

proposed by the Bureau of Indian Standards (BIS) for drinking water (BIS-2003, revised) were used to decide the suitability of ground water that occur in study area for drinking purpose. The classification of ground water samples falling below desirable limit (DL), between desirable & maximum permissible limit (DL-MPL) and above maximum permissible limit (MPL) for drinking water purpose limit is shown in the following **Table 9.3**

Parameters	Drinking water Standards (IS-10500-91, Revised 2003)		Total No. of GW	Samj	ples (< DL)	Sar (DL-	nples •MPL)	San (>N	nples IPL)
	Desirable Limit (DL)	Maximum Permissible Limit (MPL)	Samples	No.	%	No.	%	No.	%
PH	6.5-8.5	No relaxation	15	0	0	15	100	0	0
TDS (mg/L)	500	2000	15	8	53.33	7	46.67	0	0
TH (mg/L)	300	600	15	6	40	9	60	0	0
Ca (mg/L)	75	200	15	5	33.33	10	66.67	0	0
Mg (mg/L)	30	100	15	9	60	6	40	0	6.67
Cl (mg/L)	250	1000	15	15	100	0	0	0	0
SO ₄ (mg/L)	200	400	15	15	100	0	0	0	0
NO ₃ (mg/L)	45	-	15	15	100	0	0	0	0

It is observed from the above **table 9.3**, that than 100% of samples are suitable for drinking purposes. It is also observed that only 39% of samples show the PH,TH, Mg and Ca concentration above the Desirable Limit but below maximum permissible limit of BIS Standards. Therefore, it is concluded that the portability of ground water in major part of study area.

9.2.2 The suitability of ground water for Irrigation purpose

Water is one of the most important constituents, which is required for plant growth, which not only provides the liquid for food processing of the plants but also provides important nutrients for the growth of the plants. But when concentration of ions, are found in excess in the water, it affects the plant growth and reduces the plant yield. Therefore, it is necessary to know the quality of the water before applying in the field, so that the maximum crop yield can be obtained.

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Sodium Adsorption Ratio (SAR)

SAR is an expression pertaining to action makes up of water and soil solution and is used for characterizing the sodium hazard of irrigation water. The main problem with high sodium concentration is its effect on soil permeability & water irrigation. Sodium also contributes directly to the total salinity of the water and may be toxic to sensitive crops such as fruit trees. SAR is calculated from the following equation-

SAR = $\frac{Na^{+}}{\sqrt{(Ca^{2+} + Mg^{2+})/2}}$

Where the concentration of cations are expressed in meq/L.



Fig 9.2 Wilcox Diagram

Residual Sodium Carbonate (RSC)

Water containing carbon dioxide on way gets saturated with carbon dioxide and forms bicarbonates. The excess bicarbonates of Mg and Ca are precipitated out as carbonates. This produces impermeability to the top soil. Bicarbonate concentration of water has been suggested as additional criteria of suitability of irrigation water. Residual sodium carbonate is determined by using the following formula.

RSC = (CO3 + HCO3) - (Ca + Mg)

The suitability of ground water of study area for irrigation purpose was considered on the basis of U. S Salinity diagram in which electrical conductivity value in μ S/cm at 25°C upto 5000 μ S/cm at 25°C is plotted on one axis and the SAR values upto 30 on the other. The electrical conductivity and the corresponding SAR & RSC values of each ground water sample collected from the study area is given in the **Table 9.4**, and the EC and SAR values are plotted in **Wilcox Diagram (Fig 9.2)** and **Piper (Fig 9.3)**.

The number of ground water samples based on Sodium Absorption Ratio (SAR) characteristics falling under Good, Good to Permissible, Doubtful & Bad (Unsuitable) categories is shown in the following **Table 9.4**.

Table 9.4	Table 9.4: Classification of ground water for irrigation based on SAR values						
EC		SAR Value					
microsiemens/cm		<10 (S1)	10-18 (S2)	18-26 (S3)	>26 (S4)		
at 25°C	Quality	Good	Good to	Doubtful	Bad		
			Permissible		(Unsuitable)		
	Total No. of	No. of	No. of	No. of	No. of		
	GW Samples	samples	samples	samples	samples		
< 100	-	-	-	-	-		
100-250 (C1)	1	1	-	-	-		
250-750 (C2)	7	7	-	-	-		
750-2250 (C3)	7	7		-	-		
2250-5000 (C4)							
> 5000							
Total	15	15					
Overall Pe	rcentage	100%					

From the Table 9.4, it is observed that 100% of samples show SAR values below 10 and falling in the Low Sodium (alkali) Hazard Zone (S1). Such type of water can be used for irrigation on almost all soils with little danger of development of sodium exchangeable problem. Out of 15 samples collected from study area is having EC above < 2250μ S/cm at 25° .

The High Salinity Water (C3) cannot be used on soils with poor drainage. Even with adequate drainage, special management for salinity control may be required and plants with good salt tolerance should be selected.

The Very High Salinity Water (C4) is not at all suitable for irrigation under ordinary conditions, but may be used occasionally if the soil is permeable by providing adequate drainage and irrigation water must be applied in excess to provide considerable leaching and very salt tolerant crops should be selected.

Based on above **table 9.4**, ground water samples are classified with respect to salinity and sodium hazard is presented in **Table 9.5**.

Table 9.5: Classification of ground water samples with respect to salinity and sodium hazards							
Type of Classification	Characteristics	No. of samples falling	%				
C1S1		1	8				
C1S2							
C2S1	Medium salinity and low sodium water	7	46				
C3S1	High salinity and low sodium water	7	46				
C4S1	Very high salinity and low sodium water						
Total		15	100				

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Fig 9.3: Trainer piper diagram

10. IMPACT ASSESSMENT OF THE STUDY AREA

10.1: IMPACT ON THE GROUND WATER REGIME

The REL occupies a small part of Tilda Block of Raipur district. The total area of Tilda Block is 740 sq km (Dynamic Ground Water Resource Estimation as on 2022). The stage of Ground water extraction in Tilda Block is 53.76%, as discussed earlier. The block has been categorized as "Safe". There is an improvement in category of the block as compared to 2020 categorization.

from the comparison of mean water levels of the year 2019 to 2021 with respect to the years 2022 in pre-monsoon period it is found that all the villages in core zone which are considered for analysis showing decline in the range of -0.2 to -0.8 m. except Gaukheda and Paraswani villages which are showing rise of water level in the ranges of 0.16 to 0.18 m and 57 % of the villages in buffer zone(10 Km Radius) are showing decline in range of -0.1 to -0.8 m while 43 % villages are showing rising in water level in the range of 0.02 to 4.96 m. In post-monsoon period, it is found that 80% the villages in core zone (5 Km Radius) which are considered for analysis showing decline in the range of -0.08 to -0.8 m. remaining 40% of wells are showing rising water level in the range of 0.23 to 1.0 m. In Buffer zone about 43% village are showing decline in water level of -0.35 to -0.8 m. and remaining 57% village are showing rise in water level of 0.04 to 3.5 m. The area showing falling trend more than 20 cm/yr are of considerable significance which is attributed to increase in draft in selective patches.

In conclusion, if the decline per year is more than 0.20 m then for the period of four years it will be more than 0.8 m which is considered as significant but in the present scenario all the villages of core zone and buffer zone considered for analysis shows decline less than 0.8 m over the period of four years, so it is evident that in there is a marginal decline in water level trend in pre and post-monsoon period over the period of four years.

10.2: IMPACT ON SURFACE WATER SOURCES

• In the study area around the REL, ground water occurs in the weathered and the cavernous part of the formation and also the fractured zones in the area. The top soil and shallow aquifer existing down to the depth of about 20 metres below ground level generally supports the dugwells which is used for domestic purpose only.

• There are several water bodies including ponds and tanks, which are natural water conservation structures and also augment the ground water resources through natural recharge. Presence of river and

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canals running from north to south are additional water sources in the area. The availability of surface water through rivers and ponds etc, release the stress on ground water resources.

• Thus, a good annual rainfall along with favourable features such as landuse, water bodies, rivers, canals etc. makes the area excellent repository of ground as well as surface water sources.

As per the water level trend analysis from the year 2019-2022 in the study area indicates that the decline in water levels over the period of observation. The decline rate is more in core zone and comparatively low in buffer zone.

10.3: IMPACT ON WATER QUALITY

From the water testing report of the study area 100% of samples are suitable for drinking purposes. It is also observed that only 39% of samples show the PH,TH, Mg and Ca concentration above the Desirable Limit but below maximum permissible limit of BIS Standards. Therefore, it is concluded that the portability of ground water in major part of study area.

The chemical analysis of water samples for major parameters indicates that there is no visible or significant adverse impact on groundwater quality of buffer zone due to Plant activities. All the parameters are under permissible limit of as per drinking water norms IS: 10500 from chemical analysis of ground water collected in the study area it is evident that ground water quality is well within permissible limits for domestic as well as irrigation purposes

10.4: MITIGATION MEASURES

From the well inventory data, it can be clearly established that most of the villages have good ground water source and the water level is also shallow. In general, the hydrogeological condition varies depending on the geological and climatological setting of the project site. Hydrogeological consequences of plant area are governed by the nature and duration of rainfall. And it can be seen from the hydrographs that there is a declining trend which creates the potential zone for recharging. The industry has to adopt measures for recharging ground water within the premises and adopting suitable water conservation techniques such as recycling and reuse. Through RWH recharging the rainwater in to aquifer has been undertaken in the premises of the plant. During monsoon rain water in the plant is stored, used and recirculated for industrial use. Since, plant is operating above water table and zero discharge; there will not be any adverse effect on local water body due to plant activity.

10. CONCLUSIONS & SUMMARY

Adani Power Limited (APL), India's largest private sector thermal power producer, announced the completion of acquisition of Raipur Energen Limited, which owns and operates a 1,370 MW (2 X 685 MW) Supercritical power plant at Raikheda village, in Raipur District of Chhattisgarh.

The area is drained by tributaries of Seonath River especially by Banjari River and Khorsi nala. Banjari River is north flowing tributary to Seonath River and flows in the western part of the project area while Khorsi nala flows in the east of project area.

The study area is characterized by flat undulating terrain with regional slope to the north-east and south west. The average elevation in the southern portion is around 280m while in the north is 275 mamsl. The average land slope of the area is works out about 4 per km from toposheets (1:50000scale), Survey of India.

Geomorphologically the study area is represented by Pediment, Pediplain, Buried plain and Flood Plain. The Pediplain is developed in the major parts of the study area. They are also control by fractures and joints. They are having gently sloping smooth surface of erosional bed rock.

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 & shale at depths.

The depth to water level on ground water of May 2022, it is observed that the overall depth to water level remains between 3.69 to 12.7 meters below ground level. The pre-monsoon depth to water levels ranges between 5 and 10 mbgl in 5 km radius 60% of the villages, water levels more than 10 mbgl are observed in the villages namely Bharuwadih khurd villages and less than 5 observed in 33% villages. In 10 km radius depth to water levels ranges between 5 and 10 mbgl are observed in 76% of the villages, water levels more than 10 mbgl are observed in remaining 24 % villages of buffer zone. Water level less than 5 mbgl. recorded at Mohrenga, Dhansuli, Raikheda, Murra and Khapri villages .

The depth to water level of Nov 2022 remains between 1.3 and 7.7 meters below ground level. The post-monsoon depths to water level range of 0 to 3 mbgl are observed in 66% villages of core zone (5 km Radius), about 26% villages shows water level in the range of 3 to 5 mbgl and more than 5 mbgl at Bharuwadih khurd village. In the area of 10 km radius ground water levels less than 3 mbgl are observed in the 42% villages, about 29% villages shows water level in the range of 3 to 5 mbgl and more than 5 mbgl and more than 5 mbgl are

Seasonal ground water level fluctuation in the study area is varies from 1.59 to 7.16 meters. Lower range of water level fluctuation is also observed along the river course followed by > 6.4 to 6, & 2 to 4.

Overall, from the comparison of mean water levels of the year 2019 to 2021 with respect to the years 2022 in pre-monsoon period it is found that all the villages in core zone which are considered for analysis showing decline in the range of -0.2 to -0.8 m. except Gaukheda and Paraswani villages which are showing rise of water level in the ranges of 0.16 to 0.18 m and 57 % of the villages in buffer zone(10 Km Radius) are showing decline in range of -0.1 to -0.8 m while 43 % villages are showing rising in water level in the range of 0.02 to 4.96 m. In post-monsoon period, it is found that 80% the villages in core zone (5 Km Radius) which are considered for analysis showing decline in the range of -0.08 to -0.8 m. remaining 40% of wells are showing rising water level in the range of 0.23 to 1.0 m.In Buffer zone abour 43% village are showing decline in water level of -0.35 to -0.8 m. and remaining 57% village are showing rise in water level of 0.04 to 3.5 m. The area showing falling trend more than 20 cm/yr are of considerable significance which is attributed to increase in draft in selective patches.

In conclusion, if the decline per year is more than 0.20 m then for the period of four years it will be more than 0.8 m which is considered as significant but in the present scenario all the villages of core zone and buffer zone considered for analysis shows decline less than 0.8 m over the period of four years, so it is evident that in there is a marginal decline in water level trend in pre and post-monsoon period over the period of four years.

In the study area, the ground water flow direction is towards north-east and north- west. However, in the core zone, the flow direction is North-West and South-East. A local variation in flow direction is also observed, the mining lease is located in the zone of surface water divide.

In the major portion of the area the yield ranges between 1 to 5 lps indicating the area is covered by flaggy limestone and cavernous while in rest of the area it is 1 to 3 lps covered with shale.

In the study area both shallow and deep aquifer occurs. The shallow aquifers of the study area occur within an average depth of 20 m. In general, the yield of dug wells ranges from 40 to 60 m³/day. Deep aquifer system in the area mainly formed by the Raipur group of rocks mainly Chandi formation which comprises of limestone and shale. The deep aquifers of the area are mostly developed by way of bore wells in the area whose depth varies from 60 to 80m. Tarenga formation in the area is more productive & yield around 1 to 8 lps, while limestone in the area along & nearby river courses yield 1 to 5 lps of water.

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The aquifer parameters of the study area covered by limestone for deep aquifer the transmissivity values of phreatic aquifer tapped in open well in general varies from 4 to $8.5m^2/day$ while specific capacity ranges from 15 to 40 lpm/m/day. However, for deep aquifer the transmissivity ranges from 15-32 m²/day and at places it ranges up to $40m^2/day$. The potential fractures for boreholes up to 100 mbgl depth in the area are recorded at various depths i.e. 40-45, 60-65, 75-80, 90-95 mbgl and are 4 to 5 in numbers.

The ground water resources within 10 km of radius estimated on the basis of norms as per GEC'2015 indicate that the total ground water resource of the present study area is of the order of 3549.16 Ham while the total extractable ground water resources in the area are of the order of 3194.26 Ham. Gross ground water extraction in the area is around 1717.26 Ham while Balance ground water resources are1477 Ham. The stage of ground water extraction in the area is around 53.6 % which comes in "SAFE" category.

Total recharge potential of **1906907.95** cum of rainfall runoff can be harvested at feasible, viable and sustainable location annually, based on hydrogeological condition trench and recharge pits use for ground water artificial recharge.

percolation pits may be with dimension as 1 m (length) x 1 m (width) x 2 m (depth) with 8" dia. injection well of 90 m depth having 8" plain pipe up to 6 m depth Thereafter, 7" dia. necked borehole in rock may be made up to 84 m depth by DTH drilling machine. Each structure made at minimum spacing of 100 m may be made capable of recharging 195 m^3 /day by each pit. The inlet of the structure may be kept 1 m above pond bed leaving, 1 m water column for settlement of silt/dust etc. The annual cleaning/ removal of silt/ dust from the pond bed are suggested before monsoon for efficient working of system. We have already two no's of Recharge pond to recharge the ground water of the study area.

The detailed chemical analysis for water samples drawn at six locations at plant area (Ash Dyke ponds RESERVOIR POND) and 9 villages of buffer zone for non-metallic ingredients like pH, Turbidity, TDS, TSS, CaCO3, Ca, Cl, Mg, SO4 & SiO2 and metallic ingredients like Pb, Hg, Ag,Mn,Zn, Fe, & Cr etc. were done in-2020. The data indicates that the ground water quality is improved in downstream for most of metallic and non-metallic ingredients and most of the ingredients are in permissible limit as per IS:10500-2012.

The majority of chemical constituent of all samples are within permissible limit and suitable for drinking, irrigation and industrial use, fluoride contamination is observed only at Bottom Ash Pond 02, Plant Area may be due to ash, and Iron concentration is slightly higher in all sample due to leaching of

iron from laterite. Higher concentration of Mn observed at Mohrenga village and Mg contamination observed at Mura. Rest of the parameters is within permissible limit.

The geochemical classification of ground water, of study area has been carried out by using Piper Diagrams the ground water is of Ca/Mg/Na-HCO₃ Cl type. The analysis of ground water samples collected from the area suggests that type of water in the major part is bicarbonate dominating type, The suitability of ground water of study area for irrigation purpose was considered on the basis of U. S Salinity diagram in which electrical conductivity value in μ S/cm at 25°C upto 5000 μ S/cm at 25°C is plotted on one axis and the SAR values upto 30 on the other. The electrical conductivity and the corresponding SAR & RSC values of each ground water sample collected from the study area.

It is observed that 100% of samples show SAR values below 10 and falling in the Low Sodium (alkali) Hazard Zone (S1). Such type of water can be used for irrigation on almost all soils with little danger of development of sodium exchangeable problem. Out of 15samples collected from study area is having EC above $< 2250 \mu$ S/cm at 25°.

The High Salinity Water (C3) cannot be used on soils with poor drainage. Even with adequate drainage, special management for salinity control may be required and plants with good salt tolerance should be selected.

The Very High Salinity Water (C4) is not at all suitable for irrigation under ordinary conditions, but may be used occasionally if the soil is permeable by providing adequate drainage and irrigation water must be applied in excess to provide considerable leaching and very salt tolerant crops should be selected.

The present study reveals that there is no adverse impact of Ash Dyke Ponds on ground water regime of the area both on water levels as well as water quality.

Sr. No.	Plant Activities	Pollution Control Measures				
1	Coal Yard	Dust Suppression System				
2	Coal Handling system:	Dust Suppression System				
	 Crusher House Coal Bunker Coal Transfer House 	Dust Extraction & Dry fog diffusion systems Dust Extraction System Dry Fog diffusion system				
3	Boilers	Electrostatic Precipitators (ESPs)				
4	DM Plant	ETP & Neutralization Pit.				
5	Domestic Effluent	Sewage Treatment Plant (STP)				
6	Fly Ash Storage Silos	Dust Extraction System (Bag Filters)				
7	Fly Ash & Bottom Ash Disposal	Ash Pond /Dyke				
8	Vehicle Movement	Concrete Road & Road Sweeping Water Sprinkling System in Ash Dike Area.				
9	Dispersion of Emission	275 m Height Chimney				
10	Reduction of Gaseous Emission	Low NOx Burners FGD for SO2 removal (proposed)				
11	Flue Gas Desulphurization System (FGD)	As per MoEF&CC's Notification dated 31st March 2021, Raipur TPP is falling under Category "C" Non- retiring TPPs and the timelines for compliance of SO2 emission is up to December 2024. Accordingly, the work is under progress				

List of Pollution Control Equipment/Devices

MINISTRY OF POWER CENTRAL ELECTRICITY AUTHORITY THERMAL CIVIL DESIGN DIVISION Monthly Abstract of Ash Generation and Utilization (For the Period from 1st April 2022 to 31st March 2023)

Name of Power Utility / Company: Raipur Energen Limited

NAME OF THERMAL POWER PLANT:

Raipur Energen Limited Village: Raikheda, Block: Tilda, District: Raipur (Chhattisgarh)

INSTALLED CAPACITY (Total): 1370 MW **PERIOD OF REPORT:** 1st April 2022 to 31st March 2023

	ASH GENERATION AND UTILIZATION (in LMT)					MODE OF ASH UTILIZATION AND UTILIZATION IN EACH MODE (in LMT)											
SI. No.	Month	Coal Consumption	Ash Content of Coal %	Ash Generation	Ash Utilization	% age Utilization	Fly ash based products viz. bricks, blocks, tiles, fibre cement sheets, pipes, boards, panels;	Cement manufacturing, ready mix concrete;	Construction of road and fly over embankment, Ash and Geo-polymer based construction material;	Construction of dam;	Filling up of low lying area;	Filling of mine voids;	Manufacturing of sintered or cold bonded ash aggregate;	Agriculture in a controlled manner based on soil testing;	Construction of shoreline protection structures in coastal districts;	Export of ash to other countries;	Any other eco-friendly purpose as notified from time to time.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
1	April-22	5.08861	38.40	1.95377	1.95377	100.00	0.02512	0.88128	0.02271	0.00000	0.15470	0.86996	0.00000	0.00000	0.00000	0.00000	0.00000
2	May-22	4.72315	38.30	1.80873	1.80873	100.00	0.02328	0.87927	0.01288	0.00000	0.14750	0.74580	0.00000	0.00000	0.00000	0.00000	0.00000
3	Jun-22	4.56584	38.68	1.76584	1.76584	100.00	0.02333	1.05651	0.00974	0.00000	0.11878	0.55748	0.00000	0.00000	0.00000	0.00000	0.00000
4	Jul-22	3.63813	38.45	1.39886	1.30459	93.26	0.01344	0.97439	0.00676	0.00000	0.02720	0.28280	0.00000	0.00000	0.00000	0.00000	0.00000
5	Aug-22	3.00506	37.85	1.13726	1.06331	93.50	0.01772	0.90852	0.00264	0.00000	0.01800	0.11644	0.00000	0.00000	0.00000	0.00000	0.00000
6	Sep-22	3.71054	38.08	1.41279	1.30683	92.50	0.02210	1.05624	0.00430	0.00000	0.01820	0.20600	0.00000	0.00000	0.00000	0.00000	0.00000
7	Oct-22	2.79147	38.64	1.07848	1.10488	102.45	0.01296	1.05751	0.00651	0.00000	0.02790	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
8	Nov-22	3.92263	39.14	1.53512	1.53327	99.88	0.02150	0.85205	0.01183	0.00000	0.12550	0.52239	0.00000	0.00000	0.00000	0.00000	0.00000
9	Dec-22	5.35879	39.59	2.12128	2.07481	97.81	0.09932	0.93314	0.01337	0.00000	0.71805	0.31093	0.00000	0.00000	0.00000	0.00000	0.00000
10	Jan-23	4.65575	42.13	1.96148	2.09785	106.95	0.04931	0.88924	0.01875	0.00000	0.63485	0.50570	0.00000	0.00000	0.00000	0.00000	0.00000
11	Feb-23	4.69104	41.40	1.94221	1.92553	99.14	0.01669	0.78217	0.02172	0.00000	0.66729	0.43766	0.00000	0.00000	0.00000	0.00000	0.00000
12	Mar-23	5.17696	41.48	2.14766	2.33617	108.78	0.00246	1.22169	0.01078	0.00000	0.22735	0.87389	0.00000	0.00000	0.00000	0.00000	0.00000
٦	TOTAL	51.32797	39.48	20.26348	20.27557	100.06	0.32721	11.49201	0.14198	0.00	2.88532	5.42905	0.00	0.00	0.00	0.00	0.00

Note: (i) Ash means all type of ash including Fly Ash, bottom Ash and Pond Ash etc

(ii) Quantity of ash may be provided in Lakh Metric Ton (LMT) upto five decimal places
 (iii) Ash utilisation in Column (6) shall be equal to summation of modes of ash utilisation in each mode i.e. summation of column (8) to column (18)

Abbreviation:

MW - Mega Watt

TPS- Thermal Power Station

KM - Kilometer

LMT - Lakh Metric Tonne

Kcal - Kilocalories

Adani Power Limited, Raipur

1370 MW (2x685 MW) Coal Based Thermal Power Plant

Annexure VII

Green Belt Development Details at Adani Power Limited, Raipur

SI. No.	Description	Quantity / Unit
1	Plantation on 33% land of 850 acres	280 acres
2	Density of plantation	2500 plants / Hectare
3	Area required per plant	4.0 SQM
4	Total no. of plantation since commissioning	217762 Nos.
5	Total no. of plantation in FY 2021-22	6714 Nos.
6	Total no. of plantation in FY 2022-23 (till 31.03.2023)	16172 Nos.
7	Survival Rate	>90%

Plant species Planted at Adani Power Limited, Raipur

Sr. No.	Location	Area in (Hect.)	Tree (No.)	Тгее Ѕрр.	Remarks
1	Different locations inside premises	2.84	5318	Ficus religiosa, Ficus bengalensis, Conocarpus, Mimusoaps illengii, Pongamia pinnata, Azadiracta indica, Anthocephalus cadamba, Cassia fistula, Delonix regia,	Planted in June & July 2022
2.	CWPH & SYCR Between area.	0.61	Putranjeeva, Casuarina, Mahogany, 1 450 Bauhinia blackiana, Cassia fistula, Conocarpus,		Planted in June & August 2022
3.	All internal approach roads of plant premises.	2.94	7368	Teak	Planted in September 2022
4.	Precision Workshop surrounding.	0.14	90	Bauhinia blackiana, Ficus bengalensis, Swietenia macrophylla, Azadirachta indica	Planted in October 2022
5.	Safety Park	0.41	1031	Mixed Plantation (Mahogany, Conicarpus, Ficus Black, Cassia fistula, Delonix regia, Bauhinia blackiana)	Planted in December 2022
6.	Security main Gate to CSR premises, Safety Park back side and Hostel premises.	0.96	180	Mahogany, Delonix regia, Ficus black, Avelandea, Sizizium cumini,	Planted in December 2022
7.	Helipad Ground	0.76	937	Conocarpus, Bougainvillea, Casuarina	Planted in December 2022
8.	WTP	1.07	288	Plumeria & Pulchurima, Casuarina, Bogunvellia, Mahogany	Planted in January 2023
9.	NDCT Central and South.	1.48	510	Mixed plants (Bauhinia, A. indica, Mahogany, Putranjeeva, Bakul, Delonix, Cassia fistula)	Planted in January 2023
	Total	11.21	16172		

Annexure - VIII



2022-23

Annual Progress Report - RAIPUR



Deepak Kumar Singh

4/2/2023

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Preface

Adani Foundation Raipur under the guidance of Adani Power Limited, Raikheda started the CSR activities since October 2019 after the handover & take over from GMR Group. Initially we took 6 core villages under CSR arena ie; Raikheda, Bhatapara, Gaitra, Khapri, Chicholi, Gourkheda villages. And other 10 villages constitute from Railway siding & others like Khamahariya, Konari, Bartori, Bahesar, Tulsi, Tarashiv, Murra, Chhattoud, Sontara, Samoda. During the initial phase of in 2019-20, AF continued with need-based analysis study & undergone the primary level basic village survey in all 16 villages. Identified core areas of working in the field of Education, Health, Sustainable Livelihood & community infrastructure Development. As the site is located near to State capital therefore, it has a huge potential of addressing development initiatives & partnering growth together in association with community. Raipur Energen Limited is located at third phase of Raipur Industrial area "Bartori". Village Bartori represents Industrial Park & also shadows under Railway village of REL plant.

We started with Navodaya Coaching Centers & immediately the results floated in colors. Initial year of 2019, 8 students got selected in Jawahar Navodaya Vidyalaya, Raipur. Since then, the selection wheel paced with 32 students in 4 years of Adani Foundation's aegis. Now, 12 Navodaya Coaching Centers are running under Adani Foundation Raipur. Another program under Education vertical is "Nooni Laari", benefits 60 college girls to avail free transportation Bus service to commute to-fro from villages to College, Tilda. School events binds the student interest towards education, school, teaching, learning environment & also enables student to develop learning behavior. Many sports events like Chhattisgarh Olympics at Raikheda School, football tournament at Kharora, Bahesar, children's Day, Science project in school.

We also initiated Mobile Medical Health Care Unit Van with Tilda Jan Jagaran Swasthya avm Paryavaran Sewa Samiti for doorstep facilitation of primary health services. The average annual patients' beneficiaries of MHCU stands 30,000 per year including specialized health camps, blood donation camps, health awareness. Suposhan program was introduced in F.Y 2020, addressing the malnutrition in women & child & suitable interventions to provide immediate basic health care, counselling to the patients, with referral facilities at beneficiaries' doorsteps.

In Sustainable Livelihood Development Adani Kamdhenu Program (launched in 2022, 16 villages) has opened with an alternate livelihood option for marginal farmers of 16 villages. Through artificial insemination traditional cattles are converted into cross breed to enhance milking capacity of cattles. Enabling marginal farmers to add more monitory benefits in long run. SRI & Backyard BADI Development programs have led to village household families to gain more cultivation from their limited farmland through hybrid seeds & learning technical cultivation techniques. 100 farmers including SHG women gained knowledge of modern farming techniques through exposure visits at KVK, Raipur & developed Gouthan.

Adani Mahila Movement for Advancement introduced in year 22-23, 50 underprivilege women & girls are learning sewing & tailoring art & again get engaged in Garment Production Center, run by Saheli Mahila Swa -Sahayata Samuh, Raikheda. Adani Foundation support in operation, mentoring, guiding the overall operation of garment production center. GPC achieves highest production of 96,662 nos. with total revenue earned or women's income stands to Rs. 4,19,956/- in year 2022-23. During the initial phase, 20 girls' trainees associated with GPC & during the month of Dec'23 to Feb'23 additional 30 women from Tarashiv village joined at sewing training center. Post sewing training of two months, they shifted to Garment Production center for commercial stitching & individual earning started. Now the center is running in two batches. Adani Foundation objective through Garment Production Center is to develop more women earning hands & attain sustainable livelihood for community.

During this year, Adani Foundation explored possibility of Natural Resource management "Water". Chhattisgarh Stands low underground water table resulting in scarcity of water at summers, irrigation & agriculture gets disturb, domestic water dependency of villagers faces difficult due to pond drying ect. We conceded 22,500 Cum water harvesting by deepening 6 ponds in village: Raikheda, Gaitra, Chicholi, Murra & Tulsi.

Message from Business Head

It gives me immense pleasure to present the Annual Report of Adani Foundation – Raipur for FY 2022-23. As a responsible corporate citizen, we always believe in creating long term values for our stakeholders with the motto of "Growth with Goodness". We are committed to building a sustainable future by driving positive changes in the areas of Education, Healthcare, Sustainable livelihood Development and Community Infrastructure Development.



Over the past year, we have continued to focus on our core values of integrity, teamwork, excellence, and

customer focus. Our efforts have resulted in achieving good bonding between communities where we serve. We are proud to report that our CSR initiatives have touched the lives of thousands of people directly or indirectly across the intervention area.

Our education programs have provided quality education to underprivileged children, our Healthcare interventions have brought medical facility close to the communities, and our Sustainable Livelihood Programs have empowered many people with skills and resource to become self-reliant. We have supported community SHG women to operate Garment Production Center, that provides self-employment opportunity to 50 Women & earn fruitful sustainable livelihood for themselves. Expansion of unit is planned in preceding years to add more operational hands in center & facilitate more income generating women entrepreneurs in community.

I am feeling delighted to share with you that, our operational Navodaya Coaching Center has facilitated 10 students to clear Jawahar Navodaya Entrance exam resulting students in getting standard education with free loading & boarding facility. The selection counting has added 32 students since 2019.

Our efforts will give sustained access to health, sustainable livelihoods, access to quality education which will eventually upgrade their standard of living. We would like to take this opportunity to thank our employees, partners and stakeholders for their unwavering support and commitment towards our shared vision of a better tomorrow. We remain
steadfast in our commitments to creating positive impact and contributing to the sustainable development of the communities we serve. We hope you find this report informative and insightful, and we look forward to your continued support as we embark on another year of Growth with Goodness.

Demographic Profile

Adani Power Limited (Raikheda) is located at village Raikheda which is about 20 Kms from Tilda & comes between Tilda Kharora Road. The nearest railway station, Bus stand, CHC, & Degree college is located at Tilda Town. Nearest Police Station is located at Kharora town which is 12 kms from plant. Tilda is well connected with state Capital Raipur by rail & road route. Block administration officials like SDM, Tehsildar, BMO, BEO, BMO offices are place at Tilda. Block is boon with Government College, ITI college, for higher education, Community Health Center, NRC, Mission Hospitals to avail health services,

Vision: -

To accomplish a passionate commitment to social obligations towards communities, fostering sustainable and integrated development, thus improving quality of life"

Mission: -

"To play the role of a facilitator for the benefit of the people without distinction of caste or community, sector, religion, class, or creed, in the field of education, community health and promotion of social and economic welfare and upliftment of the people in general".



Executive Summary

Adani Power Limited Raipur in Chhattisgarh are focused in 16 villages near to POWER Station (2x685 MW) Super critical Thermal Power Project and its Railway Corridor in Tilda Block of Raipur district. The villages covered under CSR activity is namely Raikheda, Bhatapara, Chicholi, Gaitra, Gaurkheda and Murra (Project Affected Villages) and Tulsi, Bahesar, Khamharia, Konari, Bartori, Tarashiv, Chhattod. (Railway siding Village). Approximate population of these villages is 37,000. While the rapport building activities in the project area started in March 2009, the actual work started in June 2009. Till March 2022 CSR Activities of REL is focused in 16 Project affected Villages. REL-AF Team at Chhattisgarh comprises of Program Manager, one Senior Project officer, three Project officers, 17 field volunteers.



1.1 Education

NAVODAYA COACHING CENTER: In view of the Jawahar Navodaya school entrance examination, foundation has established 12 Navodaya Coaching Centers at villages Raikheda, Bhatpara, Gaitara, Khapari, Tarashiv, Chhatoud, Sontara, Mura, Konari, Khamharia, Gaurkheda and Chicholi. Since inception of the program, total 55 students from our coaching centers have secured their seats and currently studying in Jawahar Navodaya school–Mana. Total of 120 Students are registered for the Navodaya Coaching in 2022-23 session at Adani Foundation's running Navodaya Coaching Center. Online classes as well as offline center-based classes are continued in our 12 centers. Navodaya faculties conclude students counselling, parents counselling & extended service of individual's child home visit.

Navodaya Vidyalaya Coaching Centre -Successful Students



Laxman Verma (Konari)



Shital Sen (Tarashiv)



Ragini Dhruv (Gourkheda)



Arpit Harvansh (Tarashiv)



Ghanisht Verma (Gaitra)



Ayush Verma (Tarashiv)



Sakshi Verma (Tarashiv)



Prachi Verma (Raikheda)



Kavya Sahu (Chhatoud)



Jattin Verma (Chhatoud)

Total Seat	Total	Total Seats	Total	Adani Foundation	Success (%)
at	Seat	(Urban– Tilda)	Seats	Navodaya	(Under Rural Quota Base)



Navodaya	(Tilda		(Rural-	Successful	
School	Block)		Tilda)	Candidates.	
(Raipur District)				(2021-22)	
80 Nos.	20 Nos.	6 Nos.	14 Nos.	8 Nos.	57.14%

NONI LAARI: - Transportation facility "Noni Laari" exclusively for girls for their further studies from our 6 Project Affected Villages (PAV), The girl students who desire to pursue their higher education can opt for this facility for commuting to PG College-Tilda, which is about 25 kms. away from PAV.400 girls from PAV's have completed their graduation from PG College so far as there was no transport facility available to reach out for college & peruse their studies. The connection between the girls' students & their studies was reestablished by adani foundation. Availing this free facility by girls, in return they are providing free coaching to children at their village. Each girl will provide education to minimum 5 students as **"Swa-daan"**. It will help in raising the primary level education standard in villages. Swa-Daan benefits approximately 250 -300 primary & Middle school students of local communities.



PRAYAS Coaching: - Prayas career coaching center was established at village Tarashiv with a motive to benefit the job aspirant's youth who are preparing for competitive exams. A batch of "Prayas-30" was made by selection of 20 students from an entrance exam. 30

adani Foundation

students from local villages are preparing for Defense/ Police Force entrance exam from our Prayas Coaching center located in Tarashiv Village.





Infrastructure Development in Schools: -

Schools without basic infrastructure like building, toilets, water facilitation & educational infrastructure is like "vehicle without fuel". Adani Foundation envisages the growth engine by creating basic infrastructures in Schools. Adani Foundation conceded construction of additional rooms at Government Primary School, thematic & educational Bala painting work at 5 primary schools & water facilitation at Government Middle School, Raikheda benefitting around one thousand school students. Learning environment for students is as important as the lamp & a wick. Students'

Water Facilitation at Govt. Middle School- Raikheda



interest, attendance & concentration level gets motivated with only improved infrastructure in schools.

Awareness Programs: - It is well known That Awared & Educated citizens are pillars of a Developed Nation. Adani Foundation believe in raising the awareness levels of students with regards to disciplined life, social thought, community -Health & Safety awareness. Planet Earth, natural resources management, forest protection, Handwash day & environment safeguards. Continuation to it, several awareness sessions & programs were organized to raise students' curiosity regarding. Domestic 5S training by QCFI team, Community Road Safety trainings. Approximately 1600 students benefitted from awareness programs.

Important Days & Awareness: - Adani Foundation is always striving hard to strengthen those values & principles of the society. We respect the co-factors in the development of the society. Therefor we organize events celebration at schools & communities to honor the hands who laid support for society welfare & development. We organized various events as below: -

- National Day Celebration, World Environment/ Ozone/ Global Handwash/ Earth Day
- International Youth Day by supporting Sports Tournament at Kharora.
- School Sports Tournament "Chhattisgarh Olympics at Raikheda.
- Football Tournament at Gram Panchayat Bahesar.
- International Women's Day Celebration.





S.L	Activity: -	No. Of	Target Group
		Beneficiary	
1.	Safety training for Community & Students	30 Nos.	Students
2.	5S training for community students	90 Nos.	Students
3.	Earth Day celebration & awareness session	80 nos.	Primary School
			Students
4.	Organized first Aid safety training for Community Students	80 Nos.	Students
5.	Environment Day Celebration at School	100 Nos.	Students
4.	International Yoga Day Celebration	100	Community
		Nos.	
5.	Shala Parvesh Utsav- School Bag distribution at Primary	800	Students
	School, Raikheda, Bhatapara, Gaitara, Chicholi,	Nos.	
	Gaurkheda & Mura		
6.	Inauguration of Renovated School Building, Raikheda by	100 Nos.	Students,
	REL HR Head, Stakeholders.		Raikheda
7.	Fire safety training for School teacher's at Raikheda,	35	Government
	Gaitra & Chicholi under "Mukhyamantri Suraksha Avm	Nos.	School Teachers
	Apda Prabandhan Prasikshan Karyashala		
8.	Electrical Safety Talk & awareness session	60	Students and
		Nos.	community
			members
9.	Community safety awareness program for school	50 Nos.	Students
	children at High School, Raikheda		
10.	Plant Exposure visit & Awareness Session: -	40 Nos.	Briton
		Students	International
			School, Raipur
11.	Ozone Day Awareness Program, Raikheda 16 sep'22 with	400 Nos.	School Students
	support from REL Environment Dept, Ozone Day		
	awareness program about saving earth/ mankind/		
	humanity by saving Ozone layer was organized at Govt.		
	Higher Secondary School, Raikheda.		



12.	Experience sharing program Organized - experience	180 Nos.	Navodaya
	sharing program at Navodaya Coaching Center & books		students,
	distribution by COO- AF, Raikheda.		Parents
13.	Handwash Day Celebration at Govt. School Chicholi,	100 Nos.	School students
	Gourkheda. 100 students participated & learned good		
	habits of cleanliness & discipline life.		
14.	Competitive books distributed to Prayas Coaching Students.	30 Nos.	College
			students
15.	Children's Day Celebration at Middle School- Raikheda,	1050 Nos.	School students,
	all project villages schools participated in competitions		Teachers,
	like drawing & painting, best classroom decoration,		Stakeholders,
	sports, essay writing etc. Sports material with kits		Parents.
	distributed to 16 schools. Prizes distributed to 175		
	students/ winners. Teachers were also facilitating during		
	the event.		
16.	5S training & awareness session for students of	60 Nos.	School students
	Government high School, Raikheda.		
17.	5Straining & awareness session for Community	50 Nos.	Women's,
	Members of Raikheda, Gaitra, Chicholi villages.		College girls
18.	Road Safety awareness program at Primary, Middle &	120 Nos.	School students
	High School, Raikheda & Mura.		
	1. Drawing & Painting Competition.		
	2. Quiz competition		
	3. Awareness Session by REL Safety Team.		
19.	Sports Promotion/ Local Festival-	31 Nos.	Students
20.	26 th Jan Republic day cultural program was held at	300 Nos.	School Students
	Tarashiv, Raikheda, Sontara and Khamaria.		
21.	5S awareness camp at Government Higher Secondary	400 Nos.	Students
	School, Raikheda. The school is adopted under 5S		
	& various IT & Electrical, Bala Painting & Civil work is		
	ongoing.		
22.	International Women's Day	250 Nos.	Women
			Beneficiaries

Glimpse of Programs: -





1.2 Community Health

Mobile Medical Health Unit Clinic – "Swasthya Apke Dwaar": - To provide best primary medical facilities to community majorly addressing on women, child & old age's health issues, area specific dieses like diabetes, hypertension, BP & general health problems. Below table gives a glimpse of monthly patients diagnosed with disease category wise.



Adani Foundation operates Mobile Medical Health Clinic Van in and around 16 villages of REL site areas. The mobile clinic visits villages on daily basis & Medical team consists of doctor; pharmacist & Nurse provide free primary medical treatment to patients & medicines are given free of cost. Total patients benefitted through Mobile Medical Health Care Unit during the months April' 22 to March 2023 is 29081 nos.



Apart from regular mobile medical health Care unit, Adani Foundation organized several Health initiatives like specialized health Camps like Gynecology, Pediatric & Orthopedic & Yoga health Camps. Focusing more on women & child health care services & also organized cardiac health talk session for community targeting old age, women, child, cardiac patients. Adani Foundation organized Blood Donation Camp to support critical blood required patients with support of Red Cross Society, REL employee, business associates & community people. Total of 635 units of blood units collected & handed over to Red Cross Society Raipur.

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S. L	Annual Health Camps	Units (No)	Beneficiaries	Villages: -		
1.	Gynecology Camp	12	1255	Raikheda, Bhatapara, Gaitra, Chicholi, Gourkheda		
2.	Multispecialty Camp	1	275	Raikheda- Bhatapara, Gaitra		
3.	Blood Donation Camp	1	635	REL Staff, Business Associates,		
4.	Cardiac Health Talk with community	1	50	Raikheda, Bhatapara, Gaitra, Chicholi, Gourkheda		
5.	Eye Health Camp	1	427	All Villages		

6.	Yoga Health Session	1	150	Chirag Mahila Samuh Members
	Total Beneficiaries: -		2792	

1.3 Sustainable Livelihood Development

Systematic Rice Intensification- (SRI) Chhattisgarh being a rice cultivation state is so called **"rice bowl"** of the country. The state has more than 20000 types of rice variety & state economy depends on it. Systematic Rice Intensification (SRI) is a method to enhance productivity of rice per acre. Adani foundation Raipur with an objective to enhance rice production & income of farmers, foundation collected information by surveying the farmers of the area, the method of agriculture and the status of irrigation. From this it became known that there are more marginal farmers in the area, who cultivate paddy by their traditional method. There is also not enough means of irrigation, farmers are able to do their farming only during the rainy season. Since the cultivation of paddy by traditional method requires more amount of water, for which it is necessary to have a means of irrigation. The farmer of this area was not aware of Shri Vidhi and did not want to change his old method. Keeping all these circumstances in pind, agriculture, bringing changes in the way of cultivating paddy. To fulfill this objective, we undergo with 50 farmers of 6 panchayats Raikheda, Chicholi and Gaitra, Bartori, Khamariya, cultivated paddy in total 50 acres by SRI method.



The main objective of this program was to increase productivity by providing information about the scientific method of training to farmers through the support of Agriculture Department and Krishi Vigyan Kendra, all information about SRI Vidhi was made available. During the training, they were given the name of the improved seed, treatment method of seed, making nursery beds, plowing the land, method of planting and planting seedlings from the nursery, Application of manure, Date of planting and transplanting plant from nursery, Plant to plant distance, Planting from Qatar, The use of paddy wider for weeding, the consumption of water in the ground and proper care of the crop, etc. subject were made aware by the Department of Agriculture. In this way, those farmers got complete information regarding the cultivation of paddy through scientific method. Inspired by this, 50 out of 55 farmers have cultivated paddy in the 50-acre land by SRI method. The average estimation of total production of cultivation done by this method increased the crop production 30-40 percent in comparison to the traditional method. Farmers have started their crop harvesting at their farm fields.

Backyard BADI Development: -

Chhattisgarh state is a land of forest, tourism ષ્ટ paddy, ecobut horticulture activities are kept behind negligence. due to Chhattisgarh stands with low nutrition level in India, where Chhattisgarh 39.6% of children under five years are stunted and 39.2% of



children are underweight due to chronic malnutrition. Backyard BADI can play a pivotal role in this issue. Nutrition level of children can be raised through Badi development. Like development of kitchen garden, backyard farming, small horticulture development ectrs. Chhattisgarh is well known for its different varieties of green leafy vegetables, which contributes to rich source of nutrients, vitamins & minerals. Household family can raise Badi & cultivate various varieties of fruits as main crop & green leafy vegetables as intercrop.

Adani's Mahila Movement for Advancement Centre: -

Saheli Mahila Shashakt Silai Samuh (Garment Production Center): -

(Supported By Adani Foundation, Raikheda)

Adani Power Raikheda under the scope of CSR activities operates SAKSHAM Sewing training center at REL plant fence area. During the year 2021, 15 women & girls' trainees of sewing center constitute together to form Self Help Group under the core guidance of Adani Foundation, named as Saheli Mahila Shashkt Silai Samuh, Raikheda. With the common interest to collectively involve in sewing work as an economic activity & earn their livelihood. Saheli Mahila Shashkt Silai Samuh was formed on dated 25.06. 2021 to run the garment production center.

Adani Foundation Raipur team provided them sewing & embroidery artwork & also supported them with clothes amount to Rs. 2 Lakhs as raw material for their initial startup cost. SHG opened their bank account at nearest IDBI bank with small saving of Rs. 5000.00.

All the SHG members are from REL core villages like Raikheda, Gaitra, Chicholi, Gourkheda. SHG identified & selected their core representatives as President, Secretary & treasurer & fixed their roles & responsibility by themselves. With initial support & guidance from Adani Foundation team, SHG manufactured various types of materials like









Bags, school Bags, women garments, nose masks, uniforms. Adani Foundation support in operation, mentoring, guiding the overall operation of garment production center. GPC achieves highest production of **96,662** nos. with total revenue earned or women's income stands to Rs. **4,19,956**/- in year 2022-23. Initially 20 girls associated with GPC & during the month of Dec'23 to Feb'23 additional 30 women from Tarashiv village joined to sewing training center. Post training, they shifted to Garment Production center for commercial stitching & individual earning started.



Kamdhenu Program (In Association with BAIF):

With a vision to improve the livelihoods of farmers in the project villages, Kamdhenu Program was launched in October'22 in auspicious presence of Adani Foundation COO Sh. Chandrashekhar Gowda Ji. Based on the perception, Livestock rearing is a major source of rural household income and has been practiced as an allied vocation in concurrence to agriculture. Livestock development program of BAIF covers large ruminants like; Cow, Buffalo, goat & Poultry medical veterinary services, which costs high in ratio for farmers.



A holistic approach of integrating different aspects of breeding, nutrition, health, management ectrs is followed for augmenting income and strengthening farmer's or cattle rearer's secondary income source for the family. Extended doorstep service is provided to farmers for lowering hurdle & pain of transportation & cattle medical expenditure. The most important service of Artificial Insemination at doorstep of farmer's house is key component

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of program. The focus has been to upgrade dairy breeds like Jersey, Holstein Friesian & to promote indigenous breeds like Sahiwal, Gir, Red Sindhi, Tharpakar, Ongole etc, in Raipur project site villages.

Adani Foundation Kamdhenu programs covers all aspect of veterinary services like vaccination, deworming, artificial insemination, infertility & general treatment of all milking & meat raised cattle.



S. L	Interventions	No. of Beneficiaries
1.	Artificial Insemination	193
2.	Seasonal fodder demonstration/ Perennial fodder demo Barshim	1
3.	Wall Painting- "Pashudhan Sanvarjan"	35
4.	Farmers' Training on Dairy Development	5
5.	Fodder demonstration Napier Grass	6
6.	Pashusakhi Training	1
7.	Veterinary Health Camps (12 Nos. Unit)	2804

During the F.Y 22-23 (Nov'22- March'23), explored all ways of awareness among the community for dairy development as best alternative source of income for farmers. Through small group meetings, household surveys, wall writings, Farmer's training on Dairy development, tried to catch up the objective of program. Total 193 Al of milking cattles conceded, 12 veterinary Health Camps organized covering in 10 villages & 2804 cattles benefitted. Green fodder demonstration to farmers to explore potential green nutrients rich fodder at their own farmland.

1.4 Community Infrastructure Development

Adani Foundation contributes as CSR arm of Adani Group of Companies. Adani Foundation operates CSR activities in the field of Education, Health, Sustainable Livelihood programs & Community Infrastructure development activities in project villages of Raipur Energen Limited, Thermal Plant (Capacity- 13,70 MW- 2* 685 MW) located in village Raikheda, Block Tilda, District Raipur of Chhattisgarh State. The site is located approx. 40 Kms from state Capital Raipur city & lies between Tilda Kharora Road. Chhattisgarh state registers

approximately 1292 mm annual rainfall, but due to uneven rainfall since last year in Tilda area, the situation of water crises is raising affecting ground water table, agriculture, animal husbandry at large. In Chhattisgarh, community ponds are the essence of local tradition & culture with daily routine life starts & ends with it. Essential water requirement is affected due to less rainfall & ponds silt deposition effects the water holding capacity of ponds. Gram Panchayat PRIs have not given much stress on deepening & desilting of ponds since past years. Gram Panchayat PRIs requested Adani Foundation to undergo pond deepening activities in villages. On request from Gram Panchayat, Adani Foundation team conducted the survey of ponds & farms fields & household families located near ponds. Raikheda Bandha Talab was identified for pond deepening. Bandha Talab lies in 99 acres of catchment area, located near to community. Many villagers depend on this pond for their source of Income & daily routine activity.



Pond Deepening, Raikheda



Pond Deepening, Gaitra

S.L	Activity	Gram Panchayat	Beneficiaries (Approx.)
1.	Pond Deepening & Desilting "Bandha Talab"	Raikheda	5000
2.	Pond Deepening & Desilting "Dabri Talab"	Gaitra	2000
3.	Pond Deepening & Desilting "Bakshi Talab"	Chicholi	2500
4.	Pond Deepening & Desilting "Khadan Talab & Naya Talab"	Мигга (2)	2000
5.	Pond Deepening & Desilting "Bandha Talab"	Tulsi	7000

6.	Gaushala Shed Construction at Banjari Community Place	Khapri	Local Community
7.	Drinking Water Facilitation at Govt. Middle School	Raikheda	500 Students
8.	Murra Bhatapara Road Repair & Culvert Construction	Bhatapara	Entire village Population
9.	Construction of School Building, Govt. Primary School	Gourkheda	100 Students
10.	Construction of Drainage line (Ward No.13-14)	Bahesar	Local Villagers

Raikheda Bandha Talab is spread over the size of 35 acres & catering the needs of water usages for 5000 population for their domestic water usages. Pond is surrounded by community household & farmlands & Bhatapara village road. Approx. 6480 cum soil excavated to deepen the pond. Tulsi Bandha Talab is spread over the size of 22 acres & catering the needs of water usages for 5000 population for their domestic water usages. Approx. 6553 cum soil excavated to deepen the pond.

Pond Deepening-1, Murra



Pond Deepening- 2, Murra



Murra Khadaan Talab is located at Khadaan Mohalla & spread over 2 acres of area, but major area of land is encroached by farmers whose farmland lies adjacent to pond. Another pond excavated was Naya Talab located near Murra Bhatpara road & spread over 2.5 acres. Approx. 400 families will get benefitted from the above activity. Approx. 2154 cum soil excavated to deepen the pond. Gaitra Dabri Talab & Chicholi Bakshi Bandh is spread over 4.5 acres & 10 acres respectively. Local community residing near the pond uses pond for their domestic water usages like bathing, clothes & utensils washing, animal rearing ectrs. Approx. 3625 cum soil excavated to deepen the pond. Bakshi Talab Chicholi is spread over 3 acres of land with murrum based (Red) soil texture & located at the entry point of village. It is covered from three sides through school para community & one side through Farm field. Approx. 3631 cum soil excavated to deepen the pond.



Murra Bhatapara Road Repair& Culvert Construction

1.2 Special Programs – SuPoshan- Adani Wilmer

Project Fortune SuPoshan – an initiative of Adani Wilmer & implemented by Adani Foundation. Initiated in 2019 at site Raikheda, adopted 06 villages from core area. Its aims to reduce the prevalence of malnutrition in children under the age of 5 years, along with overall improvement in the nutritional status of adolescent girls &



Gaushala Shed -Banjari -Khapri

women of reproductive age. This has come due to various health awareness trainings to Suposhan Sanginis to become true warrior in guarding the community's health interest & bring positive behavioral change in society. The project supplements government nutrition – related schemes through supposal sanginis, locally empowered women, who work in tedem with the government resources make the program accessible to all. Presently the project covers 3 lakh plus households in more then 1200 villages across 12 states in India. In Chhattisgarh SuPoshan is covered 1477 household in 6 villages of Raipur site. India has a malnutrition rate of 31.1% lower than as compared to Chhattisgarh 31.3%. The food habits of people in Chhattisgarh neglects nutritional meals like pulses, egg, milk ectrs. There are huge variety of vegetable grown in Chhattisgarh especially leafy vegetables. There is huge requirement to aware community for nutritional thaali specially for pregnant- lactating mother & infants & growing children.

Adani Foundation Raipur has covered 1477 household in 6 villages, covering population 12000. Intervention focused group discussion (FGD) 637, Family counselling stands 629, small village day celebrations 48 nos, annual screening of children (0-5) aged group 3600 nos. Seed distribution for Kitchen garden development in 70 household families, Sneh Shivir organized for SAM children, refresher trainings for sanginis for new born care week celebration. Suposhan program has positive impacts upon community with drastic change in behavior regarding malnutrition.

1.3 Employee Volunteering Program (EVP)

Employee volunteer is an integral part of our CSR involves program. lt employee individual's participation for contribution for the development of society where we stay & live. As a part of employee volunteerism program, Adani Power employees take part actively in all CSR programs of Adani Foundation implemented in periphery villages of station. Knowledge sharing is a most effective way to educate societies for their self-awareness. Various topics has been chosen by APL employees like environment day, ozone day, water day, women's day, workplace management in schools (5S), road safety awareness between children were done through Employee volunteering programs.



Employee volunteering by staff & employees enhances relationship between community & industry & facilitate bonding. Employees contribution towards socio, economic & moral growth of community through imparting livelihood trainings, facilitating shramm- daan promotes sustainable development of society. Adani Power employees believes in giving better shape to community's development through integrated efforts. Adani Foundation

Raipur Energen Limited Raikheda praise those employee's volunteer efforts that motivate, gear up, groom, guide community for strong developed citizenship.

1.4 Case stories :-

Yogita Nishad D/o Sh. Mukhiram Nishad: -

1)Yogita Nishad age 23 years is a resident of village Gourkheda, a dependent village of Chicholi Gram Panchayat. She completed BA from local government college, Tilda. Her father is a farmer by occupation, holds 3 acres of land & cultivates only paddy to feed his family which is negligence while compared to cost vs income. Yogita's mother Smt. Amrika Nishad works as labor & earns on daily wages. She finds difficulty in getting year-round work in her surrounding area. Sometimes they find difficulty in getting daily income



for their family either from farming or labor. She is the only girl between her two brothers. Both the brothers are seasonal labors.

During the year 2021-22, Yogita came to know about sewing training from one of her friends about the adani Foundation's sewing training program which was operation at CSR campus at Raipur Energen Limited. Raikheda. Training venue was approx. 5 kms from her residents & it was difficult for a girl to allowance from her family to attend the training on daily basis. Many stigmata like sending girl alone to training center was not prevailing in local villages. But during the initial, her family supported her to undergo the sewing art training at adani Foundation training center. She usually comes together with her friends in the village. She undergoes initial sewing training for 6 months & post completion she retains in production center to earn livelihood for her family. She learnt various things like; selection of cloths, measurement, drawing & sketching on paper, scaling, cutting, neck design, stitching on normal machine & industrial machines. During the initial phase of training, sometimes due to household occupancies she was irregular in training sessions but adani foundation team motivated her to regular attend her training and avoid loss or missing of course content. All the infrastructure pertaining to training like cloths, raw materials, machine was facilitated by adani foundation at the center. She started with normal sewing machine & now working uninterruptable on industrial machine. Now she stitches approx. 50-60 women garments per day (6 hours) at CSR production center. Women garments like nighties, ethnic wear, baby suits are stitched at CSR production center & available for sale at local market. It is one stop facility for local communities to learn stitching, become employable & earn handsome livelihood for them consequently for their family. During the season she ables to earn 4000-6000 per month from stitching center which is being operated by Saheli Mahila Shashakt Silai Samuh (Chirag). AF team facilitated her in opening bank account, now she learned banking account operation also. Yogita reveals during a medical emergency in his family father got admitted at hospital at Tilda. Their family faced severe financial crises at that time. Her savings in bank account make her family to get out of that puzzled situation. Her father feels very proud of her & says "he has three sons". Yogita thanks Adani Foundation (Raipur Energen Limited) for arranging sewing training/ production center facility near to her village & the consistence support driven from Adani Foundation REL team. It would have not been possible for her to financially support her family. This makes a woman a true Lakshmi.

2) **Nooni Laari**- For many girls living in remote villages of rural India, the single biggest problem in continuing their education is the commute. During our need assessment for education program in Raipur, Chhattisgarh, it came to our notice that the enrollment of girls in the villages' government school was equal to boys. However, very few girls were enrolled for



college education compared boys and even if enrolled, the dropout rate is higher for girls than boys. In the villages of Raipur, parents send their children to school simply so that they get their meals. Most of them belong underprivileged section of the society who work as daily wage laborer. For such families, the quality or continuity of education is not really a priority even for boys, leave alone girls. The nearest Government PG College in Tilda is an average of 20 km away, one-way, from the villages where they live. Even if public transport



is available, affordability and safety are a big concern for parents. After a lot of deliberation among the Adani Foundation management, site team, parents, and students it was decided that we must support the girls to start and complete of their college education. The solution was a regular, cost-free bus service called Noni Laari. "Noni" in local parlance is used to address a young, sweet girl. The



designated driver was a local and hence known to many parents. All the college girls would commute together and would be given their individual travel pass. However, this was not all. To make this intervention more fruitful, an appeal was made to the beneficiaries.

For availing this bus service, each girl had to devote an hour of her time, six days a week, towards teaching students of classes 1-5. This arrangement of free tuition was conceptualized and titled "Swadaan", with a vision to create a ripple effect in the community. So, when Noni Laari was officially flagged off in December 2021, 60 girls began their teaching journey. After returning from college every evening, they teach the primary school children (classes 1 - 5) in their neighborhood. They conduct the classes at their own home and were monitored regularly by the Adani Foundation team.

The girls has been instructed to focus on foundational literacy and numeracy in the evening classes and not necessarily adhere to the school syllabus. The priority is to help these children get their basics right, like tables, basic calculations, the alphabet, reading and writing etc. Together, these 60 girls are teaching 300 kids in their villages! Some enjoyed it right from the beginning, others took a while to gain confidence in their abilities.

Take for instance, 20-year-old Radhika Sinha, is a third-year student of B. Sc (Mathematics). She lives in Chicholi village, and her father is a farmer. She teaches 8 children from her village and wants to continue her teaching journey in the future too while pursuing M.Sc. Ekta Sahu, a 19-year-old student at ITI Tilda who wants to become a computer operator didn't think that teaching is a skill she had. For Mahima Rajput, the 19-year-old B. Sc student who is in her second year of college, teaching the kids in her village ensures that her basics are constantly being revised. She finds this helpful as she is preparing for civil services examination.

For parents of many such girls like Radhika, Ekta and Mahima, it is a relief that their daughters are commuting safely but it is also a matter of great pride that they are helping younger children in their studies. Getting guidance from these girls has sparked an interest in kids towards academics and ignited a hope that it may lead them to a brighter future. The community members, including the village Panchayat members have appreciated the Foundation's efforts. Education is the single most powerful tool that can change lives. With support from the Adani Foundation, these girls are writing their own life story, and positively influencing the society around them.

3) RAGINI DHRUV (2022-23): - During the 2021-22, Ragini Dhruv successfully cleared the

entrance exam held by Navodaya Vidyalaya for class 6th. She became a great source of inspiration for the people of her village Gaurkheda. Daughter of sh. Ramesh Dhruv, a poor farmer, who also plays Casio in band parties for extra income. Ragini has two mothers, and they are five siblings in total. It was a poverty-stricken and quarrelsome household. A thousand praises will fall short for little Ragini, who so bravely and determinedly worked hard and became the first girl from her village to get admission in Navodaya Vidyalaya which is run by Adani



Foundation. Navodaya Coaching Center helped Ragini to achieve her goal. Under the guidance of excellent teachers provided by Adani Foundation, Ragini overcame her difficulties with mathematics, and nothing stopped her from shining bright. Ragini's father conveys his immense feeling of gratefulness to Adani Foundation and says- "My daughter is able to reach her full potential all because of Adani Foundation." Ragini set a very wonderful example by being an ardent student and her efforts are praiseworthy and applauded all over her village.

रायखेड़ा मे मनाया गया प्रवेशोत्सव



अमधिन्दु / तिल्दा रेदगा

ऑनलाइन वताल, आदि से पढाई शासन के निर्देशनुसार को सवास रूप से संवालन किया शानकीय प्राथमिक शाला , पूर्व गता। अधरक्षता श्री देववत नाएक साधामिक प्राप्त एटन प्राप्तनीय पर्व जनपद पंचायत अध्यक्ष विषया उत्तर मध्यमिक विद्यालय का नेवत, तांतीय करें पूर्व जनवद प्रवेसोत्सव संयुक्त रूप से 28जून चदस्य, भूपेन्द्र सिंह बैंस (एव. आत 2022 मंगलवार को मनाया गया। जेठ) अजनी वाउडेशन, रायपुर इन अवनर पर मुख्य अतिथि श्री एमर्जन लिमिटेड राणकेंडा, मोहन वेगेंद्र नावक ने अपने उद्वीधन में लाल नायक अध्यक्ष शाला विकाश कहा कि आज के बच्चे कल का समिति, तामेश्वर वर्मा, ओम प्रकाश भविष्य है,इस लिए इसे सवारना वर्म, गलेन्द्र वर्म प्रभारी प्राधयं, जनस्पर्क है। आपने शिक्षकों को विष्णु प्रसाद वर्मा प्रधान पाठक. बच्चो के भविष्य को संवारने के वंद्रकला वर्मा प्रयान पाठक, जिनेन्द्र लिए आहान किया। वैश्विक वर्मा व्याख्याता, मोती सिंह मतमनी के कानग विषले दो साल रतव उठोति कारवय अन्न वर्मा ही। पी गत्मक जगतंत दमी शैवक सिंह

कारण -11 मोहला

रित् इंद्रनील चौधरी, प्रीति तत्वस प्रजयति, विलेश्वर महमझ, वैपाली दाल, दाऊ लाल कोसले, मस्यमंत्री जी का संदेश वारान सरपंत प्रतिनिधि भी सतीय करें वरा किया गया अवनी कडदेशन चयदेव के दारा कहा पहली से कक्षा पांचवी तक अध्वयनस्त बच्चो को स्कूल बैग वितरण किया गया इससे पहले कार्यक्रम का शुभारंभ मां सरस्वती के तैल वित्र पर नाल्याचेंग एवं दीय प्रज्वलित कर किया गया तत्वहात राज गीत के साथ कार्यक्रम का शुभारम किया गया कार्यक्रम का संदालन सकल समन्वयक की तुलसी राम साह ने first r

विश्व पर्यावरण दिवस पर पेंटिंग प्रश्नोत्तरी प्रतियोगिता का आयोजन

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पर किसी के अलग दालाक मराके हुए मांगे उजन सेगा। जिसमें व्याप्तों का संप्रदान स्वेत्र प्राप्ता के स्वेत्र स्वार्थ पुरुष पीछा के अरमे लिए और अरमे ने पासे कम से प्रतिक्र कम ते हु जानस्वर्ग के सिक प्रत्यों का स्वार्थ का स्वार्थ के स्वार्थ का स्वार्थ का स्वार्थ जानस्वर्ग के कि उजनी प्रदानक स्वार्थ स्वार्थ कि स्वार्थ का स्वार्थ का स्वार्थ के लिए सामस्य, निश्वा क स्वार्थजात्म से लिए सामस्य, निश्वा क स्वार्थजा का स्वार्थ स्वार्थकों की स्वार्थ का आवेत्रक का स्वार्थ स्वार्थकों की स्वार्थ का आवेत्रक का स्वार्थ संवार्थकों की स्वार्थ का आवेत्रक का स्वार्थ संवार्थकों की स्वार्थ का स्वार्थक वा स्वार्थ की अपित बीस्वारम स्वार्थक वा स्वार्थक का स्वार्थक सी अपित बीसारम प्रत्य में प्रत्या में स्वार्थ साथ स्वार्थकों का स्वार्थक का स्वार्थक का स्वार्थक स्वार्थक स्वार्थक रार्थक में छात्रों के हाम बनाग गए जन्मती देते हुए अपर्शल के की अधित अपत्रिक की का स्वित अपति का आंग्रेजन का के प्रयोगराभ अभ्यतिभियतें में अर्दातने के आंग्रेस का करने के से अधित अपत्रिक की का स्वित अपति का स्वति का स्वता का स्वति का स्वत स्वति का स्वत का स्वत का स्वति का स्वत स्वति का स्वत स्वत का स्वत

में पढाई पर अतर पता है।इस मानसून तक १० हजार पेड़ 🎆 लगाने का लक्ष्य खरोरा-तिल्दा। अदाणी फाउंडेशन रा रायखेडा में विश्व पर्यावरण दिवस के



खारारा-ानलेको अथगा फाउँडवन इस रापसंड में सिंक प्लारता पिस्तेली के स्कृत पारसंड में सिंक ए पुरोवी मांग प परिया में सिंक ए पुरोवी मांग प परिया प्रतियोगता का आलेकन निक्रम पाता परायपुर एननेने लिपिन्टेंट (अतरदेश), रापखेडा सर्वत के इस कार्लकन में डाम पंचालत रापखेडा, नौता, पिरोपोल, सेपसेडा, तार्वाफत, मुरा एवं छतीन के जतीने पाता हराके पूरी संचाई अवलासक के कोओ में मजसूर कहारिश छालीसए के आंतन देश हजा से मांग वेजीकन का नुका उद्देश्य पर्वारण कर कार्जने प से में आय परिया का स्वार्थ कार्जन्म का मुका उद्देश्य पर्वारण एवं एनजीसक की बोज आपसी संचय माइला

जनजीवन के बीच आपसी संबंध व महत्व के बारे में जानरूकता प्रदान करना था।

अदाणी फाउंडेशन द्वारा संचालित नवोदय कोचिंग के 10 बच्चों का नवोदय विद्यालय में चयन

का गई थी। जिसकी संख्य 2021 तक बारह ग्रामों तक न गयी।

Media coverage

अमृत संदेश । अंबिकापुर

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• उम्रस सवैधा । असिकापुरा फिर लकार को चॉडिंग खुलन कारत नवेरद लिखाल के प्रकृष्ठ । कुल कार्य नवेर कार्य कार्य जात्र कार्य नवेर कार्य कार्य जात्र कार्य नवेर नवेरद नवारत कार्य नवेर नवेरद नवारत कार्य नवेरद नवारत कार्य नवारत नवेरद कार्य जात्र कार्य नवारत नवेरद कार्य नवार कार्य नवारत नवेरद कार्य नवार कार्य नवार नवेरद नवार कार्य नवार कार्य नवार नवार कार्य नवार नवेरद नवार कार्य नवार नवेरद नवार कार्य नवार नवेरद नवार कार्य नवार नवेरद नवार कार्य नवार कार्य नवार कार्य नवार नवार कार्य नवां नवार कार्य नवां कार्य नवां कार्य नवा कार्य नवां कार्य नवां कार्य नवां कार्य नव



रायपुर, 21 जुन (असं)। एनेर्जेन लिमिटेड (आरईएल) के अदाणी फाउंडेशन ने 8 वें अंतर्राष्टीय योग दिवस पर योग शिविर का आयोजन किया। आज 21 जन को इस अवसर पर आरईएल के प्रांगण में योग शिविर आयोजित किया गया। इस शिविर का मुख्य उद्देश्य योग की महत्ता को समझाना और इससे होने वाले फायदों से लोगों को बीच जागरूकता फैलाना है। योगाभ्यास का शुभारंभ ओम के उच्चारण के साथ हुआ। योगाभ्यास शिविर में आरईएल के समीपस्थ ग्रामों रायखेडा, चिचोली, गैतरा इत्यादि सहित 150 से अधिक ग्रामीण नवजवान युवा बच्चे, स्व-सहायता समूह की महिलाएं इत्यादि द्वारा योग अभ्यास में बढ चढ कर हिस्सा लिया गया। शिविर के आरम्भ में सीएसआर टीम द्वारा योगाभ्यास के महत्व को बताया गया इस दौरान क्षेत्र के नौजवान योग शिक्षक श्री हितेश वर्मा द्वारा उपस्थित जनों को योगासन, ध्यान एवं प्राणायाम से संबंधित विभिन्न प्रकार की योग क्रियाओं अभ्यास कराया।

उन्नत धान बीज वितरण कार्यक्रम में सात गांव के किसान हुए लाभान्वित

दबंग रिपोर्टर » रायपुर

रायपुर एनेजेंन लिमिटेड (आरईएल) की अदाणी फाउंडेशन द्वारा किसानों को उन्नत किस्म के बीजों का वितरण किया जा रहा है। इसमें अब तक संयंत्र के आस पास के ग्राम पंचायतों रायखेड़ा, चिचोली, गैतरा, तराशिव, खम्हरिया, बरतोरी और कोनारी सहित सात ग्रामों के किसानों को उन्नत किस्म की धान बीज का निःशुल्क वितरण किया गया। आरईएल के सामाजिक सहभागिता के अंतर्गत अदाणी फाउंडेशन का मुख्य उद्देश्य क्षेत्र के



उन्नत किस्म के धान का उत्पादन और वद्धि बीजों के वितरण के पर्व सभी किसानों को कथि रोपण पढ़ति से उन्नत खेती का दो दिवसीय

की आधुनिक विधि श्री विधि अर्थात सघन धान



प्रशिक्षण का आयोजन कृषि विज्ञान केंद्र, रायपुर के सहयोग से किया गया। जिसमें उपरोक्त सभी ग्रामों के किसानों ने भाग लिया। अदाणी फाउंडेशन के ऑफिस परिसर में आयोजित इस कार्यक्रम में श्री ओम प्रकाश सेन (कृषि विज्ञान केंद्र के मास्टर ट्रेनर एवं प्रेसिडेंट- आरुंग फार्मसं प्रोडसर कम्पनी, आरंग) ने किसानों को श्री विधि की संपूर्ण तकनीकियों की जानकारी दी और इसे अपनाने के फायदों को भी बताया। प्रशिक्षण के बाट सभी किसान कम पानी में भान उपज और इसके उत्पादन की जानकारी पाकर संतष्ट नजर आवे और प्रशिक्षण एवं

बीजों के लिए अदाणी फाउंडेशन और आरईएल को धन्यवाद दिया। उल्लेखनीय है कि आरईएल, अदाणी

फाउंडेशन द्वारा आस पास के 14 ग्राम पंचायतों में शिक्षा, स्वास्थ्व, आजीविका संवर्धन और संरचना विकास के कई कार्यक्रम संचालित करता है। वहीं समय-समय पर उत्कृष्ट कृषि के क्षेत्र में किसानों के आय में वृद्धि के लिए खेती के आधुनिक तकनीकों की जानकारी के साथ-साथ उनके पशुधन की पौष्टिक आहार को बनाने का प्रशिक्षण और चिकित्सकीय शिविर का आयोजन भी कराता रहता है।

Two-day blood donation camp organised Se I

On occasion of b'day of Chairm Adani Group-Gautam Adani

Gautam Adam Raipur, Jun 24: On occs-sion of birthday of Chairman Adami on Priday a organization of the con-composition of the con-only in the Group's institu-tions in India, but abroad as well. In this series, special blood donation camps were organised in all the projects of Adami Group in Chabitisgent viz at Raipur district and efforts were based to blood donation. A two do blood donation moves and the first action in Tilda block of Raipur district of Adami

Group, under the guidance of Adan's Foundation in the plant premises. In this two-down tractures in this two-contractures in this two-down tractures in the second working in the company along with all the officers and employees took part in blood doantion in large number. In these two days camp, a total of 340 until cross Society of India, Raipar On this occusion the entire staff of Raipar office of Adami Group domated ra-tion viz. rice, dal, and fruits of did age Home in Maxa. The objective of this person end mission related to in the second the second related to it and create wavereness amog people that by domating blood on regu-lar basis they can benefit a lot on health front. The camp began on June 23 at REL in Thida by lighting of

traditional lamp by Station flead Rambbax. In his ad-dress he held blood dons-dress he held blood dons-dress he held blood dons-traditional lamp held blood donations to the mankind and appealed all the employ-es to take part in the cam-page do the series of the series of the series of the series of the of REL staff was done and the series of the series

ग्रामीणों को स्वरोजगार और वैश्विक बाजार से जोडने अदाणी फाउंडेशन ने अहमदाबाद में आयोजित किया ग्राम भारती कार्यक्रम

कार्यक्रम में ग्राम रायखेड़ा की सहेली महिला सशक्त सिलाई समूह और ग्राम परसा की मब्स की भागीदारी समवेत शिखर न्यूज

रायपुर। छत्तीसगढ़ के रायपुर और सरगुजा जिले की ग्रामीण महिलाओं के स्वरोजगार और उनके उत्पादों को वैश्विक बाजार में ख्याति दिलाने अपने मा सुर के अरवणी पहड़ीना हुए। असरववार सिंध मुख्यतन में तीन दिप्सीय प्राप्त भारती कराइंक मा अयोवन किया भाषा परपूर किले के ग्राम रारखेल में स्थित युप्युर प्रनेजन को गति देते हैं, को फडोदान के हेठ अभिस ह्या ओरीगीया पनि ओरी पोठेकाल क्याणिय, संगम अपथा का भ्रद्रतना भा प्राम भारता कारकम का संपुत्रता के ग्राम भरमा का माहला उद्यमा जा वह सारसजा के कारकम की वीधिक गरी तिस्त्र वही कार्ककम का सुख्य देश के कारक पर बहुदरोतीय सहकारी सोमित (महान) की प्राउन करने और ग्रामीण स्तर पर स्वसारका लोकल के तहत अन्य वन्त्रों में अदागी फर्डडेझन महिलाओं ने भी भाग लेकर अपने उत्पादें को समूर्वे के माभ्यम से स्वयोजगार के क्षेत्र में जारी द्वारा समुद्यविक सलगामित के अंतर्गत गाँठत प्रदर्शनी एवं किकों की। इसके आलावा उतपरोर का कार्यों के तहत तैयार हुए उत्पादों की प्रदर्शनी हित्र प्रसादयता सम्प्राई, जो स्वर्योव प्रांगों को की प्रेरण प्रोद्रस्त कर्पन सै निर्दिर-क्यारामी का एक प्रभवलाती में प्रजलाक का उन्हें येतगात उत्परीतता को ध्वान में रखते हुए, उत्पाद का निर्माण इत्यादि, गुजरात की मेरफरज्ञ सहेली स्वस्तायता के लिए प्रेरित किया गया।



अदाणी फाउंडेशन ने किया मरा शासकीय प्राथमिक स्कल में बैग वितरण

प्रतिदिव नेटवर्क रायपुर अदली कार्थवेलन ने सम पंचायत पुरा के साववी को क्यून के तारीर किया है कार्याप्र किंग के तिदा किकारवांड में सिवा रायपुर पान के साम पुरा के सकी पानेक स्कूल में कार्याक्त स्कूल रावा वदान में प्रायंक्त स्कूल रावा वदान सेन में निकारत म का भुज्य – मुरा के स्कूलों में पढ़ने व्यार्थियों को शिक्षा के लिए में नियमित उपस्थित को साहू ने की। साथ ही जनपद प्रतिनिधि – टोकेन्द्र गायकवाड, लकेश्वर कोसले (राजीव गांधी युवा कलब अध्यक्ष) रेराग वर्गा म ानयामत उ त करना है। कम के मुख्य मरा की सरा त करना है। क्रम के मुख्यअतिथि ग्राम मूरा की सरपंथ –श्रीमती ।रुव तथा अध्यक्षता थ – श्रीमती पुष्पा मगवती युवा क्लब (कोषाध्यक्ष) मानकी को पंचायत मूरा नूतन हरुव गेसले, सुरेंद्र साहू, पाल, श्रीमती कांति

क्ंजलाल



प्रमुख आजा विकार संचारि क्षेत्र स्कूलों पवाई नवोदा त करता है। आसमास के होनहार प्रदान कर रहा है।

विश्व पर्यावरण दिवस पर पेंटिंग प्रश्नोत्तरी प्रतियोगिता का आयोजन मानसून तक १० हजार पेड़ लगाने का लक्ष्य

ख्योगा-तिल्पटा। अथाणी भारतीयन द्वारा राजवेहा में शिक्ष पर्वापाल निर्वता के अस्तार पर प्राय पर्वापाल निर्वता के अस्तार पर प्राय पर्वपाल निर्वता के पॉर्टन प्रतिप्रतिप्रांत का आयोधन किया पाना रापाएर एनजे निर्वार्थक (अतरीरान), राजवेहा स्वरंभ से स्व अप्रतिप्र कामोरा का आयोधन किया प्रावीर के स्वोदान वे प्राय के अप्रतिप्र कामोरा के प्रति प्राय ताकी स्वर्णक के आत्माना के केवी में प्रायत तीभी निर्वारण क्रमित्वा के केवी में प्रायत तीभी निर्वारण कर आज सीच सी ने ज्याद तीभी

खेतों में पैदावार और किसानों की आय में

विधा में स्वायार आर किसाना के आप में वृद्धि के उद्देश्य से अदाणी फाउंडेशन ने गुरुवार को रावखोड़ा के आस पास के किसानों को कृषि विज्ञान केंद्र में शैक्षणिक

विशाना वर्ष कृति विद्यान कर्यू में रखानक भ्रमण कराया । रायपुर एनेजेंन लिमिटेड के आसपास के ग्राम रायरहेड़ा, चिचोली, ताराशिव, खन्दरिया एवं बरतीरी के कुल 40 किसानों ने कार्यक्रम में भाग लिया।

किसानों न कावक्रम में भाग (तथा) इन किसानों को कृषि के लिए मिट्टी परीक्षण, जमीन तथा बीज की स्थिति, खाद एवं पानी को मांग्र, खरीफ फसल के अलावा

के गण्डना किंसा। इसके जन र व्यक्तिय के कैसे कि प्रमान तक र किंसी के देखी का करने का स्वय की की के देखी का करने का स्वय को की के देखी का क्या के की पर की रहते किंसा में स्वय प्रमा स्वय का प्रमुख उद्देश्वर पायलवा पा (क्या के प्रार्थ के कालकता) स्वर का प्रमुख उद्देश्वर पायलवा पा (क्या के प्रार्थ के कालकता) सरे में जालकता प्रदान करना का को पुरस्कार प्रारंत किंसा मा सरे में जालकता प्रारंत करना को की प्रस्कार के स्वये में ति का की स्वर्ग के स्वर्ग के की कालकता के स्वर्ग में ति निपाल कर स्ताए गए। कार्यक्रम का मुख्य उद्देश्य पर्यावरण एवं जनजीवन के बीच आपसी संबंध व महत्व के बारे में जानां के द्वारा बनाए गए पर्यावरण पर आधारित बिज्ञें की प्रदर्शनी

r/A

किया गया। वस के बारे में विस्तृत आर्यापत के वी अमित

Charles and में प्रश्नोत्तरी ती किया गया, मयता के साथ तानकारी प्रदान प्रदर्शन पर छात्रों

श्रीवास्तव ने उपस्थित खत्रों को संबोधित करते हुए का कि. सर्चुक टाइ द्वार जून 5,1972 को स्टाकठोम कॉफॉस दीरान बातवरण सुरक्षा की कार्रदाई को अलल में लाया गया था,जॉकि पर्वाकरण संरक्षा को दिला में पहला कदम था। इसलिए हर वर्ष स्या।न जोड्ने कार्यत्र अमित सहित कुमार अमल में रूए की (हर वर्ष शता है। के लिग यह दिवस पांच जून उन्होंने कहा कि प्रयो

हर किसी को अगभा दायित्व समझते हुए, अग अगन तोगा। किसमें पुरावजें का गंगदान सक्षे मारुपपूर्व तो आलत है। हमारी युख्य पीढ़ी को आपने लिए और अपने अगे सारों कल को सुरिधित करने हेनु आपरक सेना होगा। ज्वावनीय है कि उन्हाजें प्रत्य के उन्होंतन की लिए स्वास्थ्य, शिक्षा व स्वारेजार। रावचेर्या है और उनके हिए उनके हिए पूरी तरह प्रतिबद्ध है और उनके द्वारा समय पर जासकरकता कार्यक्रम व ध्य शिविसों का आपोजन कर के तको बेशतर लाइफ स्टाइन से की दिला में कार्य कर रही है। का गाँ आर्याएल के चरिष्ठ प्रवंभक की त जीवादनत पह थी पुष्कीर्या काल्टिंगे । अदयपी फाठेडेसन से जी देषक रहित और प्रीत प्रवारि की ताल कीडले, कोई के प्रवार करव एवं



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तकनीकी जानकारी उपयोगी

ओमप्रकाश दामां, परंस दंगां, मंगलू दामां, तामेश्वर दामां, दीपक खंजरे घर्व अवय सावंदेयों ने कृषि दिखान केन्द्र ने निल्ले जानकरियों और दाक्वीतियां दीप प्रयोगी तामया और इन्हें अपने कृषि में इस्लेमाल करने की बात कहीं। यही जारहीपर और अदायों फाउंडेसन को हरूके आयोजन के लिए घन्यवाव दिया। अवाणी हसक जायजंब के एन्ट्र एकवांच दिया जवांग एजडोना राज्येना प्रकार कुछ के किस्ता के किस्ता सहमाजित के अतर्जत क्षेत्र के किस्ता के की के अनुविध किर्म से जोड के किस्ता प्रदान कर किस्ता प्रदान कर रहा है। जिसमें पहले इन किस्ता के पान के उन्हात सेनों के लिए श्री प्रदान पर प्रसिक्षण, हासूरिह एक बीज किरण तथा कृषि विशेषज्ञों से उन्नत खेती के समान्ध मे जानकारी तथा प्रदर्शन फार्मों के लिए केवीके, रायपुर का समण इत्यदि शामिल है।

कृषक क्षमण में मौजूब कृषक जानेश्यर वर्मा, ओमप्रकाश वर्मा, परस वर्मा, मंगल, वर्मा,

一行子 王子 18

प्रथा नेव साथ, उद्यापर तमाना कमाना ने किया ने किसाने के सिंह किया ने के साथ कि कियानों को कृषि केंट्र के प्रतर्गन कमों का जलान-तिलाटन के अंतर्गत सोजवंदन, मुंग, अनुसार हे। वर तलान-तिलाटन के साथ रथी। अवलोकन कार्त हुए संपतित कृषि उद्धर का उत्पादन, एका उत्पादन किसके प्रस्ता के संबंध में कृषि वैद्यानिकों से सीभों तकनीविजी काविस्ताण्डक जनकरी थिया। अंतर्गत जम्म के किराल, ये में कल्प कृषि वैद्यानिक डाक्टर उत्तम कुम्पर ने की देखेती तक कम पाने वाल काटा ज्यांन में भी मौतर्गत कार्य कृषि वैद्यानिक डाक्टर उत्तम कुम्पर ने की देखेती तक कम पाने वाल काटा ज्यांन में भी मौतर्गत कार्या किसानें को कृषि केंद्र के प्रदर्शन फार्में का जलहन-तिलहन के अंतर्गत सोवाबीन, मुंग अवलोकन कराते हुए संवीधत कृषि उड़द का उत्पादन, फल उत्पादन जिनके तकनीकियों का विस्तापूर्वक जनकारी दिया। अंतर्गत आप के पौधे में कलम, बेर में कलम,

1.6 Appreciation letter from stakeholder(s)

कार्यालय ग्राम पंचायत, रायखेडा कार्यालय, खण्ड चिकित्सा अधिकारी, विकासखण्ड–तिल्दा 0 वि.खं.-तिल्दा, जिला-रायपुर (छ.ग.) जिला-रायपुर (छ0ग0) श्रीमती सुकबती कुर्रे (संतोष कुर्रे) ानितील -ग्राम व पोस्ट - रायखेड़ा तिल्दा, जिला-राायपुर (छ.ग.) मो. - 9009898147 E-Mail ID - bmotilda@yahoo.co.in सरपंच -: गाम पंचायत, रायखेडा क्रमांक/ सी.एच.सी./सत्रह/2023/0)/ तिल्दा-नेवरा, दिनांक:- 22/02/2023 सचिव -: सरपंच संघ, तिल्दा पति उपसरपंच अडानी फाण्डेशन n 1/08/202: श्री बदीप्रसाद वर्मा गाम-रायखेडा प्रति वि.ख.-तिल्दा. जिला-रायपर छ०ग० -: **tit** : प्रोगाम मेनेजर श्री प्रारत्वंत यातव सामुदायिक स्वास्थ्य केन्द्र तिल्दा नेवरा के अंतर्गत संचालित पोषण पुनर्वास केन्द्र में उपकरण - अडानी फाउन्डेशन रायरवेश विषय:-श्रीमती निर्मला वर्मा प्रदाय हेतु धन्यवाद पत्र एवं पावती के संबंध। श्रीमती अनुसईया मानिकपुरी विषय !- लालाख गहरीकरग कार्य प्रजतः मे आदर उपरोक्त विषयांतर्गत लेख है, कि आपके द्वारा आज दिनॉक-22 फरवरी 2023 को श्री घनज्ञ्याम लाल धीवर खन्यवाद प्रेषित वाखना ! विकासखण्ड तिल्दा के अंतर्गत सामुदायिक स्वास्थ्य केन्द्र तिल्दा नेवरा में संचालित पोषण पुनर्वास केन्द्र में श्री खिलावन प्रसाद श महोदय श्री कुशल दास मानिकपुरी Stadiometer, Infantometer & MUAC का 1 नग प्रदाय किया गया है। विधयान्तर्गत सेवव हे कि हमारे अडानी श्रीमती रूखमनी यद उक्त संबंध में स्वास्थ्य एवं परिवार कल्याण विभाग आपका सार्वर धन्यवाद करता है, एवं यह फाउलेशन द्वारा ग्राम पंन्यायत रायरवेहा में लड़ा शीमनी जलन तमां putch पत्र पावती के रूप में सादर प्रेषित है। तालाल जो कि 39 एक की एरिया में पानी भराव श्रीमनी कौशिल्या शर्मा खण्ड चिकित्सा अधिकारी होता है जिससे गोव के कुछक असने रनेतो में फाल श्रीमती विमला धव विकासखण्ड-तिल्दा, जिला-रायपुर (छ.ग.) सिंचाई हेतु पानी का उपयोग करते है जितभे श्रीमती मीना नायक फाउन्डेशन घारा निया डुभा तालाल गहरीकरग पु.क्रमांक/ सी.एच.सी./सत्रह/2023/ ९ तिल्दा-नेवरा, दिनांक:-22/02/2023 धीमती रोहिणी नायक धीमती कॉनि वर्मा मिल का पन्धर सा महस्य कराया है उसके बिल तातान-1. मुख्य विकित्सा एवं स्वास्थ्य अधिकारी, जिला–रायपुर छ०ग० की ओर सौदर सूचनार्थ प्रेषित। 2. कार्यालय प्रति। प्रे पैचायत की भोर- से खट्टत - खहुत राखवाय श्रीमती हलसी मानिकपर्र अगर आपसे आवाय है कि यह लडा तालाल जिले शीमती सभ्या (नीत) तर खांधा के नाम से आना आता है। इमका भविष्य खण्ड चिकित्सा अधिकारी शीयती लता बार्ड वर्षा इसीर भी गहरीकरा हव सीन्दर्यकरा की निहास हीमरूरत है जिले पुरा करने हेसु स्वागत रहेगा। विकासखण्ड-तिल्दा, जिला-रायपुर (छ.ग.) श्री मारूतिनंदन वर्मा श्रीमती पार्वती बाई वर्मा भी चन्नलाल निषाद हान्यवाद रतकवती की कार्यालय ग्राम पंचायत, तुलसी (नेबरा) कार्यालय ग्राम पंचायत गैंतरा-खपरी U विकास खण्ड-तिल्दा, जिला-रायपुर (छ.ग.) जनपद पंचायत – तिल्दा-नेवरा, जिला – रायपुर (छ.ग.) 493116 सरपंच श्रीमती हेमीन सगरवंशी संगर्क दिनांक 111.07 2022 7879679598 कमांक.<u>147</u> -मति. क्रमांक. Gio 11/07/2022 gfJ. श्रीमान अदान फारेडेशन पा. लि. भोग्राम मेनेजर राम्प्रेडा- रामपूर (६.ग.) उन्हाली फाउन्डेवान सामग्रेडा टलान तिला सामुर इत्तीफाद विषम - वंधवा ततात गहरीकरा हेत सह धायवाद. वण्या तालान जहरिन्द्रण आर्म पुणी नावत महादम. उपरोक्त लेख हैं दि आपने हे जारा - महोरप् विषणान्तानि लेख है कि फायने जम्पनी गाम पंचायत तुल्ली (नेक्स) डे वंधवा तत्मव मे स्थय अडानी फाऊर्डेशन द्वारा तालाव गहरीयळा याप गाम (गहरीकरण) उा माम किया गमा है जिस्ते किटे-क्यापत मात्र हो हिया जापा था जो राप पुर्व हो जापा भाषा " अदाली का. रा. सीजान रायपुर एनर्जन किमी. नामप्पेडर (607) को समस्त राम वासी एव पंचीयत हो देपापत रात्र रा 1341 गणा ना जा जा 30 राग्या ही तलाब गहरी रहवा हा राप आम जन ने हित के लिए अहुत ही उपमोर्गी पहल ही इसके लिए आपने एफ छेशन आर में सह रायवाट् रो एसा-त जाम वासी Ca देनापत वरिवार की आहे. भाषत वारवार की अगेर छे हउम के महचन्यवाद ऑत डवी तरह गाम विकास के धान के रावते हुए आने वाले जनम के सीन हमन्छारन्वे उारा कर्ष उहाते वहिल्ला Lune Enol सरपंच ग्राम पंचायत तुलसी व -तिल्दा, जिला-रावपुर (ठ ग.) टौपती वैष्णव (उपसरपंच) 5-ही आग्रा केंट विश्वाह के साथ मीना वर्मी (पेन) भीनी करें (पंच) Interiora in Heren Real वान पंख्यत नैवर कान पंख्यत नैवर कान राजा-रायपर (छ.ज.) प्रेमीन तमी (पंच)



1.7 Award/ recognition

RAIPUR



1.8 Beneficiaries Counts: -

S.No.	Activity Description	Direct	Indirect	Access
Α.	Education: -			
1	Jawahar Navodaya Vidyalaya Coaching Center	120	500	
2	Bala Painting at Schools	1500		
3	School Bag Distribution "Shala Parvesh Utsav"	800	3200	
4	Creating joyful learning space: School repairing & Maintenance etc. (Gourkheda)	100		
5	Noni Laari- SWADAAN	60	250	
6	Sport training & sports item & competition	16	3000	
В.	Community Health: -			
1	Mobile Medical Health Care Unit	29,081		37000
2	Specialized Health Camps	2591		
	(Gyneac, Pediatric, EYE, Blood Donation)			
S3	Health Awareness Sessions	200		
4	SuPoshan	2760	4348	
C .	Sustainable Livelihood Development			
1	Garment Production Center cum Training Center (Women)	50	200	
2	SRI & Backyard BADI Development Program (HH Family)	100	400	
3	Kamdhenu Program (AF-BAIF) (Livestock's)	2804		37000
4	Events/ Sports Celebration (Community)	3000		
D.	Community Infrastructure Development			
1	Pond Deepening (Raikheda)	3717		
2	Pond Deepening (Gaitra)	1012		
3	Pond Deepening (Chicholi)	1208		
4	Pond Deepening (Tulsi)	3801		



5	Pond Deepening (Murra)	2589	
6	Construction of Drainage (Bahesar)	737	
7	Construction of Gaushala Shed, (Khapri)	25	
8	Construction of Culvert & Road Repair (Bhatapara)	1700	

Adani Foundation team

S. No.	Name	Position
1.	Deepak Kumar Singh	Program Manager
2.	Preeti Prajapati	Senior Project Officer
3.	Khileshwar Mahmalla	Project Officer
4.	Deepali Das	Project Officer



Adani Foundation, Adani Power Limited, Village Raikheda, Block Tilda, District Raipur Chhattisgarh, 493225

Annexure - IX

भारत सरकार परमाणु ऊर्जा विभाग विकिरण एवं आइसोटोप प्रौद्योगिकी बोर्ड



Certificate Tracking ID / CTID: 2305467Date of Issue / DOI: 05-Apr-2023Certificate Serial No. / CSN: ULR-TC666523000003478F



Department of Atomic Energy

Board of Radiation & Isotope Technology

Government of India



RADIOACTIVITY TEST CERTIFICATE

Ref : BRIT/RAL/DOM/1222-1229/MISC/929-936/22-23

To : M/S. RAIPUR ENERGEN LIMITED, VILLAGE RAIKHEDA BLOCK - TILDA DISTRICT RAIPUR 493225 CHATTISGARH INDIA

This is regarding the samples of "COAL, FLY ASH, BOTTOM ASH AND POND ASH " sent for radioactivity analysis vide your letter REF NO. REL/ENV/22-23/231 dt. 13.02.2023 which as per above letter is drawn from consignment with the following markings, as shown in italics:

SAMPLE DESCRIPTION

: COAL, FLY ASH, BOTTOM ASH AND POND ASH

Sr. No	SAMPLE NO	TYPE OF SAMPLE	PLACE	DATE OF SAMPLE	WEIGHT (IN KG)
1	SAMPLE #1	COAL SAMPLE	REL	13.02.2023	01
2	SAMPLE #2	FLY ASH SAMPLE	REL	13.02.2023	01
3	SAMPLE #3	BOTTOM ASH SAMPLE	REL	13.02.2023	01
4	SAMPLE #4	POND ASH SAMPLE	REL	13.02.2023	01

DATE OF RECEIPT OF SAMPLE: 23.02.2023

DATE OF COMPLETION OF TEST: 24.03.2023

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	31.3 ± 1.3	50.8 ± 5.3
2	FLY ASH SAMPLE	72.1 ± 2.5	95.2 ± 9.2
3	BOTTOM ASH SAMPLE	54 ± 2.1	91.9 ± 9.4
4	POND ASH	56.9 ± 1.9	86.2 ± 8.7

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 3 months 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

AJAY NANA THAMKE OIC, RAL

Authorized Signatory:

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://eportal.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; दूरमाष/ 022 2788 7002/ 7006

