JK Cement Works, Mangrol
A unit of JK Cement Ltd.
CIN: L17229UP1994PLC017199
C/o. Kailash Nagar - 312617, Nimbahera Distt., Chittorgarh (Raj.) INDIA
+91-1477-220098, 220087 jkc.mgrl@jkcement.com
www.jkcement.com

MGR/PC-14/C14/C11/ **Through Email** **Date: 18.11.2023**

To,
The Director (M),
Ministry of Environment, Forest & Climate Change,
Indira Paryavaran Bhawan,
JOR Bagh Road, Aliganj,
New Delhi-110003

Sub: Submission of Six-monthly **Environmental Clearance Condition Wise Compliance report of J.K. Cement Works, Mangrol, Cement Plant EC Amendment order Expansion for Clinker Production of capacity 2.90 MMTPA to 5.65 MMTPA, Cement Production of capacity 3.54 MMTPA to 7.05 MMTPA, Captive Power Plant of Capacity 25MW to 60 MW and WHRBP of Capacity 10 MW to 36MW.**

Ref.: EC letter no. - J-11015/427/2008-IA. II(M) dated. 6th August 2010

Dear Sir,

Please be informed that with reference to the above subject, we **J.K. Cememt works, Mangrol located** at Village Mangrol, Tehsil Nimbahera, District Chittorgarh, State Rajasthan here with submit the **Six-monthly Environment Clearance Amendment order condition wise compliance report for the period of April 2023 to September 2023 for Mangrol Cement Plant with CPP & WHRBP EC expansion Amendment order to your good office.**
As per MoEF & CC notification no. S.O. 5845 (E) 26.11.2018 the soft copy of same has been sent through email to moef@nic.in, ccb.cpcb@nic.in, member-secretary@rpcb.nic.in, cpcb.bhopal@gov.in, monitoring-ec@nic.in , iro.jaipur-mefcc@gov.in. This is for your information and records purpose.

Thanking you.
Yours Faithfully
For J. K. Cement Works, Mangrol

R. B. M. Tripathi
Unit Head & President (Operations)

Encl: Environment Clearance Condition wise compliance report for the period of April2023 to September 2023
Copy to:

1. The Deputy Director(S), Ministry of Environment, Forests & Climate Change, Integrated Regional office, Jaipur, A-218, Aranya Bhawan, Jhalana Institutional Area, **Jaipur-302004**
2. The Regional Director, Central Pollution Control Board, Paryavaran Parisar, E-5, Area colony, **Bhopal (M.P) 462016**
3. The Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-CUM office complex, East Arjun Nagar, **New Delhi 110032.**
4. The Chairman, Rajasthan State Pollution Control Board, 4, Institutional Area, Jhalana Doongri, **RAJ, Jaipur - 302004**

Form for Uploading Six Monthly Compliance Report			
Proposal Details			
Proposal No.	IA/RJ/IND/20196/ 2013	**Project Name**	Expansion of existing Clinker and Cement Manufacturing Capacity of M/s. J.K. Cement Works (2.90 MMTPA to 5.65 MMTPA of Clinker Production and 3.45 MMTPA to 7.05 MMTPA of Cement Production), Captive Power Plant from 25 to 60 MW by installation of an additional Coal Based Captive Power Plant of 35 MW and WHRB from 10 to 20 MW by installing an additional Waste Heat Recovery Boiler of 10 MW, at Village - Mangrol, Tehsil-Nimbahera, District - Chittorgarh, Rajasthan, and Integrated Cement Plant (Clinker 5.65 MTPA; Cement 7.05 MTPA; CPP 60 MW - Coal Based 35 MW and WHRB 20 MW) located at Village - Mangrol, Tehsil - Nimbahera, District - Chittorgarh, Rajasthan by M/s. J.K. Cement Works - Amendment in Environmental Clearance for Expansion of WHRB from 20 MW to 30 MW under the clause 7(ii) of EIA Notification, 2006
Category	**A**	**MoEF File No.**	**J-11011/267/2013-IA. II (I) dated. 08.09.2016 & Amendment dated 08.03.2019**
		Name of the Entity /Corporate Office*	**M/s. J.K. Cement Works, Nimbahera, Kailash Nagar, District Chittorgarh-31261, Rajasthan**
		Entity's PAN*	**AABCJ0355R**
Entity Name as per PAN	**J K CEMENT LIMITED.**		
Compliance Letter/Report			
Reporting Year*	2023	**Reporting Period***	April-2023 to September-2023
Remarks (if any)	Submitting herewith the Six Monthly EC Compliance Report for the period: April-2023 to September-2023of Integrated Cement Plant (Clinker 5.65 MTPA; Cement 7.05 MTPA; CPP 60 MW - Coal Based 35 MW and WHRB 20 MW) located at Village - Mangrol, Tehsil - Nimbahera, District - Chittorgarh, Rajasthan by M/s. J.K. Cement Works - Amendment in Environmental Clearance for Expansion of WHRB from 20 MW to 30 MW under the clause 7(ii) of EIA Notification, 2006.		
Details of Production and Project Area			
Date of Commencement of Project /Activity: *	Line-1: 12.07.2004. Line-2: 04.07.2014 Line-3: 29.09.2019	**Project Area as Per EC Granted (In Case of Mine Lease):** *	149.42 ha.
Actual Project Area (In Case of Mine Lease): *	149.42 ha.		

PRODUCTION CAPACITY			
Name of the Product*	**Units***	**As per EC granted***	**Production during last financial year*: 2022-23**
Clinker Production	Million Tons Per Annum	5.65	4.985310
Cement Production	Million Tons Per Annum	7.05	3.339641
CPP (Electricity Generation)	MW/Hr.	60	13388.323 MWh
WHRB (Electricity Generation)	MW/Hr.	30	195171.490 MWh

ENVIRONMENT CLEARANCE COMPLIANCE REPORT OF J. K. CEMENT WORKS, MANGROL (RAJASTHAN)
(Period: April 2023 to September 2023)

Expansion of existing Clinker and Cement Manufacturing Capacity of M/s. J.K. Cement Works (2.90 MMTPA to 5.65 MMTPA of Clinker Production and 3.45 MMTPA to 7.05 MMTPA of Cement Production), Captive Power Plant from 25 to 60 MW by installation of an additional Coal Based Captive Power Plant of 35 MW and WHRB from 10 to 20 MW by installing an additional Waste Heat Recovery Boiler of 10 MW, at Village - Mangrol, Tehsil-Nimbahera, District - Chittorgarh, Rajasthan.
EC Amendment: - Integrated Cement Plant (Clinker 5.65 MTPA; Cement 7.05 MTPA; CPP 60 MW - Coal Based 35 MW and WHRB 20 MW) located at Village - Mangrol, Tehsil - Nimbahera, District - Chittorgarh, Rajasthan by M/s. J.K. Cement Works - Amendment in Environmental Clearance for Expansion of WHRB from 20 MW to 30 MW under the clause 7(ii) of EIA Notification, 2006.

EC Letter No.: J-11011/267/2013-IA. II (I) dated. 08.09.2016 and Amendment dated 08.03.2019

S. No	Condition Type	Environmental Parameter	Description of Condition	Self-Declaration	Remarks/Reason
1	Specific Condition	Air Quality Monitoring & Preservation	The project proponent should install 24x7 air monitoring devices to monitor air emission, as provided by the CPCB and submit report to Ministry and its Regional Office.	Complied	Four Number Continuous Air Quality Monitoring Stations (CAAQMS) have been installed around the facility to monitor air quality. Real-time data is sent to the CPCB/SPCB portal.

2	Specific Condition	Air Quality Monitoring & Preservation	The Standard issued by the Ministry vide G.S.R. No. 612 (E) dated 25th August 2014 and subsequent amendment dated 9th May 2016 and 10th May 2016 regarding cement plant with respect to Particulate Matter, SO2 and NOX shall be followed.	Complied	The facility had Bag filters/Bag House/ESP installed in all respective process stacks to control PM emissions. An SNCR system was installed to control NOx emissions. Detail stack emission monitoring and co-processing emission monitoring results is enclosed as Annexure-1.
 **SNCR Shed**					 **SNCR SYSTEM**
3	Specific Condition	Air Quality Monitoring & Preservation	Continuous stack monitoring facilities to monitor gaseous emissions from process stacks shall be provided. After expansion, limit of PM shall be controlled to meet prescribed standards by installing adequate air pollution control viz. Electrostatic precipitators to clinker cooler, bag house to raw mill/kiln and bag filter to coal mill and cement mill. Low NOx burner shall be provided to control NOx emissions. Regular calibration of the instruments must be ensured.	Complied	An OCEMS was installed to monitor PM, SO2 and NOX in the process stack. BF systems for RM sections, CL and CMs, RABH coolers & kiln. ESP for coolers & boilers for PM emissions. SNCR for NOx emissions. Calibration of the CEMS instruments being done on quarterly basis.

<table>
<tr>
<td>4</td>
<td>Specific Condition</td>
<td>Energy Preservation Measures</td>
<td>Efforts shall be made to achieve power consumption of 70 units/ton for Portland Pozzolona Cement (PPC) and 95 units/tons for Ordinary Portland Cement (OPC) production and thermal energy consumption of 670 Kcal/Kg of clinker.</td>
<td>Complied</td>
<td>The use of VVFD and high-efficiency motor greatly reduces power consumption.
The specific Power and Thermal Energy Consumption is as given below:
<table>
<tr><th rowspan="2">Month</th><th colspan="2">Power Consumption (kwh/ton of Cement)</th><th rowspan="2">Thermal Energy Kcal/Kg. of Clinker (with loss)</th></tr>
<tr><th>OPC</th><th>PPC</th></tr>
<tr><td>Apr-23</td><td>67.9</td><td>54.8</td><td>769</td></tr>
<tr><td>May-23</td><td>66.8</td><td>53.7</td><td>774</td></tr>
<tr><td>June-23</td><td>68.9</td><td>54.9</td><td>788</td></tr>
<tr><td>July-23</td><td>71.6</td><td>54.9</td><td>785</td></tr>
<tr><td>Aug-23</td><td>73.6</td><td>57.5</td><td>789</td></tr>
<tr><td>Sep-23</td><td>70.9</td><td>54.6</td><td>759</td></tr>
<tr><td>Avg</td><td>69.8</td><td>55.1</td><td>776</td></tr>
</table>
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<td>5</td>
<td>Specific Condition</td>
<td>Air Quality Monitoring & Preservation</td>
<td>The National Air Quality Standards issued by the Ministry vide G.S.R. No. 826 (E) dated 16th November 2009 shall be followed.</td>
<td>Complied</td>
<td>Four CAAQMS are installed in the facility and the data is uploaded to CPCB/SPCB portal.
Manual air quality monitoring was also performed, and the results were well within the prescribed standards.
Detail Ambient Air Quality Monitoring results (Manual) for the period April-2023 to September-2023 is enclosed as Annexure-2.</td>
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<td>6</td>
<td>Specific Con</td>
<td>Air Quality Monitoring &</td>
<td>AAQ Modelling shall be carried out based on the specific mitigative measures taken in the existing project and proposed for the expansion project to keep the emissions well below prescribed standards.</td>
<td>Complied</td>
<td>AAQ modelling was performed as part of the expansion project's EIA report and was based on specific mitigation actions taken to keep emissions within prescribed standards.</td>
</tr>
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	ditio n	Preservati on			
7	Spec ific Con ditio n	Air Quality Monitoring & Preservati on	Secondary fugitive emissions shall be controlled and shall be within the prescribed limits and regularly monitored. Guidelines/Code of Practice issued by the CPCB in this regard shall be followed.	Complied	Bag filters installed at all material transfer points, enclosures for all hoppers, irrigation systems for material handling areas, covered sheds, intermediate and finished product storage silos. Fugitive emission monitoring report for the period: April-23 to Sep-23 is enclosed as Annexure-3

Bag filters installed at material transfer point

Raw material covered belt conveyor

 Raw meal storage in CF silo				 Clinker Storage Silo	
8	Specific Condition	Air Quality Monitoring & Preservation	A statement on carbon budgeting including the quantum of equivalent CO2 being emitted by the existing plant operations, the amount of carbon sequestered annually by the existing green belt and the proposed green belt and the quantum of equivalent CO2 that will be emitted due to the proposed expansion shall be prepared by the project proponent and submitted to the Ministry and the Regional Office of the Ministry. This shall be prepared within a period of 6 Months and subsequently it should be prepared every year.	Complied	7.0MW solar power plant at Plant & Colony. PPC manufacturing to lessen mineral consumption. WHRBPP for WHR. 2022-23: A total of 413,718,641 tonnes of waste, including ARMs, were co-processed as AFR.

9	Specific Condition	Human Health Environment	For the employees working in high temperature zones falling in the plant operation areas, the total shift duration would be 4 hrs. or less per day where the temperature is more than 50°C. Moreover, the jobs of these employees will be alternated in such a way that no employee is subjected to working in high temperature area for more than 1 hr. continuously. Such employees would be invariably provided with proper protective equipment's, garments, and gears such as head gear, clothing, gloves eye protection etc. There should also be an arrangement for sufficient drinking water at site to prevent dehydration etc.	Noted for Compliance	During Shut downtime, plant equipment cools down before work begins. At high temperatures, each worker should be provided with appropriate PPE's. Sufficient drinking water is provided.
10	Specific Condition	Air Quality Monitoring & Preservation	Arsenic and Mercury shall be monitored in emissions, ambient air, and water.	Complied	Arsenic and mercury monitoring is performed by MoEF&CC accredited laboratories.
11	Specific Condition	Miscellaneous	The coal yard shall be lined and covered.	Complied	Coal is stored in covered storage.

Storage Shed

Storage Shed

12	Specific Condition	Biodiversity	The project proponent shall prepare a report on impact of project on surrounding reserve forest within six months and will get it approved from the State Forest Department. A copy of the conservation with the State Forest and Wildlife Department. A copy of the same should be submitted to the Ministry and its Regional Office.	Noted for Compliance	There is no Wildlife Sanctuary, National Park, within 10 Km radius of the lease area. The same was confirmed in Letter No. 2 by Deputy Forest Ranger Mr. Chittorgarh. AF () Survey/UVS/2021-22/4089, from 13 July 2021.
13	Specific Condition	Biodiversity	The project proponent shall take all precautionary measures for conservation and protection of wild fauna in the study area. A Wildlife Conservation Plan specific to this project site shall be prepared in consultation with State Forest and Wildlife Department. A copy of the Conservation plan shall be submitted to the Ministry and its Regional Office.	Complied	An integrated WLCP is prepared for 5 limestone mines and 2 ICP owned by JK Cement within a 10km radius. In July 2021, 20% of Rs 57.07 crore paid to DFO-Chittorgarh towards WCP total of 285.30/-Cr.
14	Specific Condition	Statutory Compliance	The project proponent will also provide the latest status of the environment compliances in respect of its existing plant.	Complied	For the period of October 2022 to March 2023,, the last EC conformity report was sent via email on 17th May 2023. The letter number is MGR/PC/21/C13
15	Specific Condition	Air Quality Monitoring & Preservation	Efforts shall be made to reduce impact of the transport of the raw material and end products on the surrounding environment including agricultural land using conveyors/rail mode of transport wherever feasible. The company shall have separate truck parking area. Vehicular emissions shall be regularly monitored.	Complied	Raw materials such as coal/Pet coke are transported by rail, Fly ash is sourced locally. Truck parking area haul roads are regularly watered.

	
Water spraying system (fog system) at coal unloading point	Material Transportation by railway

16	Specific Condition	Water Quality Monitoring & Preservation	Efforts shall be made to further reduce water consumption by using air cooled condensers. All the treated wastewaters shall be recycled and reused in the process and/or for dust suppression and green belt development and other plant related activities etc. No process wastewater shall be discharged outside the factory premises and 'zero' discharge shall be adopted.	Complied	Installed ACC in CPP & WHRS. Zero Liquid Discharge Units: Treated water from WHRS and CPP is used in Cement plant for cooling purpose and dust suppression.

AIR COOLED CONDENSOR AT 25 MW CAPTIVE POWER PLANT

17	Specific Condition	Water Quality Monitoring & Preservation	Efforts shall be made to make use of rainwater harvested. If needed capacity of the reservoir shall be enhanced to meet the maximum water requirement. Only balance water requirement shall be met from other sources.	Complied	Constructed 16 artificial rainwater storage facilities (injection wells) and 01 artificial ponds for groundwater recharge in the colony and factory.

RAINWATER HARVESTING STRUCTURE (INJECTION WELL)

18	Specific Condition	Water Quality Monitoring & Preservation	Regular monitoring of influent and effluent surface, sub-surface and ground water shall be ensured and treated wastewater shall meet the norms prescribed by the State Pollution Control Board or described under the Environment (Protection) Act, 1986.	Complied	No wastewater was generated at the cement plant. Domestic sewage systems and colonies are treated with STP and used on plantations. Neutralized wastewater from CPP and WHRS is used in cement plants.
19	Specific Condition	Waste Management	All the bag filter, raw mill dust, coal dust, clinker dust and cement dust from Pollution Control devices shall be recycled and reused in the process and used for cement manufacturing. Spent oil and batteries shall be sold to authorized recyclers/re-processors only.	Complied	Process dust like Raw meal, coal, clinker & cement from BFH, RABH, ESP etc are recycled in cement manufacturing. HW -Waste Oil are sold to recyclers & batteries returned to suppliers & registered recyclers
20	Specific Condition	Waste Management	The kiln shall be provided with a flexible fuel feeding system to enable use of hazardous wastes and other wastes including biomass, etc.	Complied	An AFR feed system has been installed for the solid and liquid AFR feed.

SOLID AFR FEEDING SYSTEM

LIQUID AFR FEEDING SYSTEM

21	Specific Condition	Waste Management	The proponent shall examine and prepare a plan for utilization of high calorific waste such as chemical waste, distillation residues, refuse derived fuels etc. as alternate fuels based on availability and composition. For this, the proponent shall identify suitable industries with such waste and enter an MOU for long-term utilization of such waste as per the Environment (protection) Rules, 1986 and with necessary approvals.	Complied	CPCB/RSPCB has granted various HW/Other Waste Permits to the unit for use as AFR in cement plants. In FY 2022-23, 413,718.641 tons of waste co-processed as AFR including ARM.
22	Specific Condition	Waste Management	Efforts shall be made to use the high calorific hazardous waste in the cement kiln and necessary provision shall be made accordingly. The PP shall enter an MOU with units with potential for generating hazardous waste and in accordance with Hazardous Waste Regulation and prior approval of the MPPCB.	Complied	CPCB/RSPCB has granted various HW/Other Waste Permits to the unit for use as AFR in cement plants.
23	Specific Condition	Green Belt Development	Green belt over 33% of the total project area shall be developed within plant premises with at least 10-meter-wide green belt on all sides along the periphery of the project area and along roadsides etc. by planting native and broad-leaved species in consultation with local DFO, local community and as per the CPCB guidelines.	Complied	The total area of plant is 126.95 ha, including 42 ha of green space. There are 7.44 ha of green space within the colony's 22.47 ha total size.  No of Saplings Planted in 2022- 2023 are 23298
24	Specific Condition	Energy Preservation Measures	The project proponent shall provide for solar light system for all common areas, streetlight, village, and parking around project area and maintain the same regularly.	Complied	7.0 MW Solar Plant is installed in cement plant. Solar systems were installed according to the feasibility of areas such as roads, parking lots, and mine office rooftops.
25	Specific Condition	Energy Preservation Measures	The project proponent shall provide for LED light in their offices and residential areas.	Complied	We replaced the existing lighting in the office and living room with LED lighting.
26	Specific Condition	Corporate Environment Responsibility	All the recommendations made in the Charter on Corporate Responsibility for Environment Protection (CREP) for the Cement plants shall be implemented.	Noted for Compliance	Raw materials are stored in covered sheds, intermediate & final products are stored in silos. Fly ash is discharged pneumatically. ESP for Cooler & CPP. All roads are asphalted & vacuumed.

27	Specific Condition	Corporate Environment Responsibility	At least 2.5% of the total cost of the project shall be earmarked towards the Enterprise Social Commitment based on Public Hearing issues, locals need and items-wise details along with time bound action plan shall be prepared and submitted to the Ministry's Regional Office. Implementation of such program shall be ensured by constituting a Committee comprising of the proponent, representatives of village Panchayat and District Administration. Action taken report in this regard shall be submitted to the Ministry's Regional Office.	Complied	Various activities are carried out each year that benefit society and address issues of public consultation.

Detail CSR Activities Carried Out in FY: 2022-23

SN	Name of the project	Item from the list of activities in Schedule VII to the Act	Local Area or other	District	Amount spent for the Project (in Rs.)
1	Construction of community hall at Aakya village	Infrastructure Development	AAKYA VILLAGE	Chittorgarh	₹ 23,12,619.00
2	CC road construction at Karparam ji Khedi village		KARPARAM JI KHEDI	Chittorgarh	₹ 14,26,219.00
3	Construction. of CC road Lalukheda-Mangrol (samshan)		Lalukheda	Chittorgarh	₹ 30,12,283.00
4	CC road construction at Mangrol Village		Mangrol	Chittorgarh	₹ 23,43,190.00
5	Mangrol Road light		Mangrol	Chittorgarh	₹ 14,16,000.00
6	Skill Training program for women & Saparsh Program	Livelihood Promotion	Mangrol & Other villages	Chittorgarh	₹ 28,36,464.00
7	Water Tanker Supply shahbad village	Drinking Water Arrangement	Shahbad	Chittorgarh	
8	Const. Of school boundary wall at MGR	Educational Charity	Mangrol	Chittorgarh	₹ 12,69,944.00
9	Boundary wall Tilakheda school		Tilakheda	Chittorgarh	₹ 13,18,735.00
10	Construction of Library at Arniya Joshi		Arniya Joshi	Chittorgarh	₹ 4,62,219.00
11	School ground filling at Arniya Joshi, construction of community centre at Arniya		Arniya Joshi	Chittorgarh	₹ 7,82,619.00
12	Mangrol Playground development	Sports	Mangrol	Chittorgarh	₹ 10,97,497.00
13	Arniya toilet construction	Sanitation	Arniya Joshi	Chittorgarh	₹ 3,88,585.00
TOTAL					**₹ 1,86,66,374.00**

28	Specific Condition	Corporate Environment Responsibility	In addition to the above provision of ESC, the proponent shall prepare a detailed CSR Plan for the next 5 years including annual physical and financial targets for the existing-cum-expansion project, which includes village-wise, sector-wise (Health, Education, Sanitation, Skill Development, and infrastructure etc.) activities in consultation with the local communities and administration. The CSR Plan will include the amount of 2% retain annual profits of previous 3 years towards CSR activities for life of the project. A separate budget head shall be created and the annual capital and revenue expenditure on various activities of the CSR Plan shall also be uploaded on the company website and shall also be provided in the Annual Report of the company.	Complied	Various activities are carried out each year that benefit society and address issues of public consultation.
29	Specific Condition	Risk Mitigation & Disaster Management	A Risk Assessment Study and Disaster Preparedness and Management Plan along with the mitigation measures shall be prepared with a focus of Disaster Prevention and a copy submitted to the Ministry's Regional Office, SPCB and CPCB within 3 months of issue of Environment Clearance letter.	Complied	An approved onsite contingency plan has been submitted to your good office
30	Specific Condition	Human Health Environment	To educate the workers, all the workplaces where dust may cause a hazard shall be clearly indicated as a dust exposure area with display signs which identifies the hazard and the associated health effects.	Complied	The unit displayed environmental, health and safety slogans/messages on existing plant premises to raise awareness of the hazards and associated health implication
31	Specific Condition	Miscellaneous	Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structure to be removed after the completion of the project.	Complied	During construction, cooking fuel, portable toilets, clean drinking water, medical care and daycare were provided.
32	General Condition	Statutory Compliance	The Project authorities must strictly adhere to the stipulation made by the Rajasthan Pollution Control Board and the State Government.	Noted for Compliance	We are to abide by the law and strictly comply with the RSPCB Regulation and its amendments.

33	General Condition	Miscellaneous	No further expansion or modification in the plant shall be carried out without prior approval of the Ministry of Environment, Forest and Climate Change (MoEF&CC).	Noted for Compliance	In the event of a modification or expansion, we will inform the board beforehand and obtain approval accordingly.
34	General Condition	Air Quality Monitoring & Preservation	At least four ambient air quality monitoring stations should be established in the downward direction as well as where maximum ground level concentration of PM10, PM2.5, SO2 and NOx are anticipated in consultation with the SPCB. Data on ambient air quality and stack emission shall be regularly submitted to this Ministry including its Regional Office at Lucknow and the SPCB/CPCB once in Six months.	Complied	The unit, following consultation with RSPCB, has installed 4Nos CAAQMS to monitor PM10, PM2.5, SO2 and NOx. The data are regularly transmitted to the ministry and its RO as well as the SPCB/CPCB.
35	General Condition	Water Quality Monitoring & Preservation	Industrial wastewater shall be properly collected, treated to conform to the standards prescribed under GSR 422 (E) dated 19th May 1993 and 31st December 1993 or as amended from time to time. The treated wastewater shall be utilized for plantation purpose.	Complied	Cement manufacturing is a dry process. Introduced zero emission facilities in CPP and WHRS. Effluents from the CPP and WHRS are reused for dust suppression and machine cooling at the cement plant.
36	General Condition	Noise, Vibration Monitoring & Preservation	The overall noise levels in and around the plant area shall be kept well within the standards (85 dBA) by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels should conform to the standards prescribed under EPA Rules, 1989 viz. 75dBA (daytime) and 70 dBA (nighttime).	Complied	Mufflers, acoustic hoods, enclosures, etc. are provided in areas where noise is generated, and personnel involved are provided with PPEs.
37	General Condition	Human Health Environment	Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.	Complied	Occupational medical surveillance of employees is carried out periodically.
38	General Condition	Water Quality Monitoring & Preservation	The company shall develop rainwater harvesting structures to harvest the rainwater for utilization in the lean season besides recharging the ground water table.	Complied	16 No's injection wells have already been developed. One recharge pond for the cement plant and colony.
39	General Condition	Corporate Environment Responsibility	The project proponent shall also comply with all the environment protection measures and safeguards recommended in the EIA/EMP report. Further, the company must undertake socio-economic development activities in the surrounding villages like community development programmes, education	Complied	Various activities are carried out each year that benefit society and address issues of public consultation.

			programmes, drinking water supply and health care etc.		
40	General Condition	Corporate Environment Responsibility	Requisite funds shall be earmarked towards capital cost and recurring cost/annum for environment pollution control measures to implement the conditions stipulated by the Ministry of Environment, Forest, and Climate Change (MoEF&CC) as well as the State Government. An implementation schedule for implementing all the conditions stipulated herein shall be submitted to the Regional Office of the Ministry at Lucknow. The funds so provide shall not be diverted for any other purpose.	Complied	This condition is complied
41	General Condition	Statutory Compliance	A copy of clearance letter shall be sent by the proponent to concern Panchayat, Zila Parishad/Municipal Corporation, Urban Local Body, and the local NGO, if any, from whom suggestion/representations, if any, were received while processing the proposal. The clearance letter shall also be put on the web site of the company by the proponent.	Complied	The copy has been sent to the appropriate authorities and uploaded to the company's website. https://www.jkcement.com/environmental-compliance

42	General Condition	Air Quality Monitoring & Preservation	The project proponent shall upload the status of compliance of the stipulated environment 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 the MOEFCC at Lucknow. The respective zonal Office of CPCB and the SPCB. The criteria pollutant levels namely, PM10, SO2, NOx (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the projects shall be monitored and displayed at a convenient location near the main gate of the company in the public domain.	Complied	The criteria pollutant levels being displayed at the main gate of the company in the public domain. On the company website, the periodical reports are uploaded and sent to boards via email.
43	General Condition	Statutory Compliance	The project proponent shall also submit six monthly reports on the status of the compliance of the stipulated environment conditions including results of monitored data (both in hard copies as well as by e-mail) to the Regional Office of MOEFCC, the respective Zonal Office of CPCB and the SPCB. The Regional Office of this Ministry at Lucknow/ CPCB/SPCB shall monitor the stipulated conditions.	Complied	For the period of October 2022 to March 2023, the last EC conformity report was sent via email on 17th May 2023. The letter number is MGR/PC/21/C13
44	General Condition	Statutory Compliance	The environmental statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental conditions and shall also be sent to the respective Regional Office of the MOEFCC at Lucknow by e-mail.	Complied	The FY 2022-23 Form-V was submitted to RSPCB and MoEF& CC regional offices on September 23rd, 2023, and uploaded to our company website.

45	General Condition	Statutory Compliance	The Project Proponent shall inform the public that the project has been accorded environment clearance by the Ministry and copies of the clearance letter are available with the SPCB and may also be seen at website of the Ministry of Environment, Forest, and Climate Change (MoEF&CC) at http:/envfor.nic.in. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspaper that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same should be forwarded to the Regional Office at Lucknow.	Complied	The entity has published in two newspapers that the project has obtained an environmental permit from the MoEF&CC. Dainik Bhaskar From 2016/09/17 PATRIKA, RAJASTHAN From 17th September 2016
46	General Condition	Miscellaneous	Project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work.	Noted for Compliance	we are bound to the said condition.
Amended EC Letter No.: J-11011/267/2013-IA. II (I), dated 08.03.2019					
1	General Condition	Energy Preservation Measures	It is mentioned that there will be no pollution load increment due to enhancement of WHRB capacity from 20 MW to 30 MW. The following measures will be implemented to increase the waste heat recovery power generation up to 10 MW: Gain of 2.5 MW and 2.9 MW power generation by enhancement of boiler inlet flue temperature (from 380 480 C) by recirculation of hot air in line-2 and line respectively, i.e., total gain will be 5.4 MW. Installing a new boiler with efficient heat recovery, as there will be higher stream recovery with temperature of 440 degree with minimization of condensing temperature, with gain of 4.6 MW.	Complied	A 29.1 MW Waste Heat Recovery Based Power Plant was installed to efficiently utilize the hot gas from the cement plant.
2	General Condition	Miscellaneous	The certified EC compliance has been obtained from Regional Office (Lucknow) of MOEF&CC vide letter No.: IV/ENV/R/IND167/946/2017/732 dated 09.07.2018.	Complied	This condition is complied

3	General Condition	Miscellaneous	The proponent has mentioned that there is no court case or violation under EIA Notification to the project or related activity.	Complied	Agree
4	General Condition	Miscellaneous	The proposal was considered by the Expert Appraisal Committee (Industry-I) during its 34th meeting held on 6th to 7th August 2018. After detailed deliberations, the committee recommended for the grant of amendment to the environmental clearance with the following conditions. The power generation from waste heat recovery boiler shall be enhanced to 20 MW to 36 MW. The PP shall undertake additional greenbelt development in 5% of the total area. The PP shall construct 5 additional rainwater recharging pits.	Complied	A 29.1 MW Waste Heat Recovery Based Power Plant was installed to efficiently utilize the hot gas from the cement plant.
5	General Condition	Statutory Compliance	The ministry considered the above recommendation of EAC and hereby decided to amend the Environmental Clearance vide letter F. No. J-11011/267/2013-IA. II (I) dated 08.09.2016 with the conditions as recommended by EAC in para 5 above.	Complied	This condition is complied
6	General Condition	Miscellaneous	All other terms and conditions in the Environmental clearance vide letter F. No. J-11011/267/2013-IA. II (I) dated 08.09.2016 shall remain the same.	Agree	Noted

In compliance to the MoEF&CC Office Memorandum F. No. IA3-22/8/2021-1A.III [150512] dated 18.07.2022 regarding Sensitization of project proponents on implementation of ban on Single Use Plastic (SUP) – Unit has been conducted awareness program to their employee, stakeholders and to the society in nearby villages, photographs of the same is enclosed in as Annexure-6.

Yours Sincerely,
For J. K. Cement Works, Mangrol

(Authorized Signatory)

J.K.CEMENT WORKS,MANGROL (RAJ.)

AMBIENT AIR QUALITY MONITORING REPORT

PERIOD: APRIL-2023 TO SEPTEMBER 2023

S. No.	Location		Parameters With NAAQMS				
			PM_{10} (in µg/m³)	$PM_{2.5}$ (in µg/m³)	SO_2 (in µg/m³)	NOx (in µg/m³)	CO (in µg/m³)
	Limit		**100**	**60**	**80**	**80**	**4000**
1	NEAR TIME OFFICE	Apr-23	72.5	34.4	10.6	323.3	479
		May-23	74.8	35.3	11.6	19.9	504
		Jun-23	71.6	25.1	11.2	24.2	583
		Jul-23	71.3	31.9	10.6	16.5	499.5
		August	75.3	32.8	10.2	22.7	595.4
		Sep-23	70.3	30.5	11.5	23.5	535.3
	Half-Yearly Avg		**72.6**	**31.7**	**11.0**	**71.7**	**532.7**
	NEAR THERMAL POWER PLANT	Apr-23	76.2	23.7	9.8	14.2	570.0
		May-23	73.4	24.9	12.9	25.5	789.0
		Jun-23	72.5	21.6	13.5	24.6	844.0
		Jul-23	72.1	35.0	15.8	22.6	459.4
		August	72.9	27.4	12.4	20.1	515.3
		Sep-23	73.5	26.1	11.5	20.1	572.5
	Half-Yearly Avg		**73.4**	**26.5**	**12.7**	**21.2**	**625.0**
	NEAR FACTORY GATE	Apr-23	75.6	26.0	8.8	19.1	475.0
		May-23	69.9	28.7	14.4	20.6	591.0
		Jun-23	78.1	29.6	11.3	23.8	657.0
		Jul-23	72.2	28.7	11.3	23.8	578.2
		August	70.4	29.1	14.8	23.9	377.9
		Sep-23	75.2	29.8	13.8	23.6	469.5
	Half-Yearly Avg		**73.6**	**28.7**	**12.4**	**22.5**	**524.8**
3	NEAR COLONY GATE	Apr-23	68.1	27.9	11.3	20.4	502.0
		May-23	66.5	26.6	7.7	22.2	459.0
		Jun-23	64.3	23.3	8.4	16.7	465.0
		Jul-23	65.3	28.2	8.2	16.5	443.7
		August	68.5	24.7	9.5	17.5	572.5
		Sep-23	64.8	26.2	9.3	18.4	377.9
	Half-Yearly Avg		**66.5**	**26.2**	**9.1**	**18.6**	**470.0**

Monitored By **Checked By**

J.K.CEMENT WORKS,MANGROL (RAJ.)

STACK EMISSION MONITORING (Particulate Matter)
FOR CEMENT PLANT LINE-I

MONTH : APRIL-2023

Date	Name of Stack	Cross Sectional Area of duct (M2)	Stack Gases Temp. (Kelvin)	Gaes Velocity (M / Sec.)	Flow of gases (NM3/Sec.)	Dust Conc. (Mg/Nm3)	Mean Dust Conc. (Mg/Nm3)	Emission (Tons/Day)
06.04.2023	LSCRUSHER - 1 BAG FILTER	0.38	324	9.57	3.34	9.4	9.4	0.003
12.04.2023		0.38	331	8.92	3.05	8.6		0.002
20.04.2023		0.38	326	8.35	2.90	12.2		0.003
27.04.2023		0.38	325	6.59	2.30	7.4		0.001
07.04.2023	KILN No.1 BAG HOUSE	5.23	406	12.69	48.71	16.9	13.0	0.071
14.04.2023		5.23	395	13.73	54.17	10.4		0.049
19.04.2023		5.23	406	11.66	44.76	13.9		0.054
26.04.2023		5.23	401	13.36	51.93	10.7		0.048
08.04.2023	COOLER ESP -1	7.07	398	9.85	66.73	11.0	15.4	0.063
12.04.2023		7.07	403	10.60	71.58	17.9		0.111
18.04.2023		7.07	411	11.35	76.16	18.8		0.124
27.04.2023		7.07	401	9.24	62.20	13.8		0.074
04.04.2023	COAL MILL - 1 BAG FILTER	0.45	336	12.51	5.41	4.2	8.6	0.002
11.04.2023		0.45	338	13.15	5.63	8.5		0.004
18.04.2023		0.45	340	12.38	5.29	8.8		0.004
25.04.2023		0.45	341	12.60	5.36	13.0		0.006
STOPPED	CEMENT MILL No. - 1 BF	STOP						
07.04.2023	CEMENT MILL No. - 2 BF	0.50	365.00	15.22	7.51	13.1	15.1	0.010
13.04.2023		0.50	358.00	15.53	7.61	13.0		0.007
20.04.2023		0.50	361.00	14.98	7.32	17.5		0.006
28.04.2023		0.50	363.00	14.95	7.23	16.9		0.008

Monitored By

Checked by

JKCement

J.K.CEMENT WORKS,MANGROL (RAJ.)

STACK EMISSION MONITORING (Particulate Matter)
FOR CEMENT PLANT LINE-II

MONTH : APRIL-2023

Date	Name of Stack	Cross Sectional Area of duct (M2)	Stack Gases Temp. (Kelvin)	Gaes Velocity (M / Sec.)	Flow of gases (NM3/Sec.)	Dust Conc. (Mg/Nm3)	Mean Dust Conc. (Mg/Nm3)	Emission (Tons/Day)
05.04.2023	LSCRUSHER - 2 BAG FILTER	1.23	331	11.41	12.64	11.4	15.2	0.012
13.04.2023		1.23	336	10.44	11.39	17.9		0.018
21.04.2023		1.23	335	11.02	12.06	12.9		0.013
25.04.2023		1.23	338	12.34	13.38	18.5		0.021
03.04.2023	KILN No.2 BAG HOUSE	14.18	410.00	13.68	140.99	8.2	7.5	0.100
11.04.2023		14.18	406.00	14.01	145.82	7.3		0.092
18.04.2023		14.18	411.00	14.65	150.62	6.7		0.087
24.04.2023		14.18	395.00	13.99	149.66	7.9		0.102
04.04.2023	COOLER ESP -2	8.80	391.00	5.93	50.49	19.6	17.1	0.086
12.04.2023		8.80	390.00	6.98	58.48	15.3		0.077
17.04.2023		8.80	385.00	5.62	46.94	21.6		0.088
27.04.2023		8.80	392.00	5.25	43.99	11.8		0.045
03.04.2023	COAL MILL - 2 BAG FILTER	2.00	337.00	8.49	16.32	7.8	10.1	0.011
11.04.2023		2.00	335.00	10.37	19.87	12.9		0.022
18.04.2023		2.00	336.00	9.81	18.74	12.7		0.021
24.04.2023		2.00	339.00	10.85	20.66	6.8		0.012
05.04.2023	CEMENT MILL No. -3 BF	6.60	365.00	12.24	77.91	8.0	8.7	STOP
10.04.2023		6.60	367.00	14.47	91.51	8.6		0.068
19.04.2023		6.60	361.00	13.64	85.98	9.6		0.071
26.04.2023		6.60	359.00	13.40	84.20	8.7		0.063
05.04.2023	PACKER BF-1 (L-2)	0.79	323.00	11.44	8.58	6.4	11.5	0.005
13.04.2023		0.79	321.00	12.45	9.36	15.7		0.013
19.04.2023		0.79	322.00	10.34	7.75	11.6		0.008
28.04.2023		0.79	322.00	10.75	8.06	12.3		0.009
08.04.2023	PACKER BF-2 (L-2)	0.79	322.00	12.32	9.30	12.6	12.2	0.010
12.04.2023		0.79	324.00	11.41	8.58	10.7		0.008
20.04.2023		0.79	320.00	10.31	7.71	10.1		0.007
27.04.2023		0.79	320.00	10.66	7.99	15.2		0.010
04.04.2023	PACKER BF-3	0.79	321.00	10.27	7.79	11.9	13.9	0.008
10.04.2023		0.79	322.00	11.58	8.76	9.1		0.007
17.04.2023		0.79	320.00	12.01	9.05	17.6		0.014
25.04.2023		0.79	321.00	12.43	9.34	16.9		0.014
03.04.2023	PACKER BF- 4	0.79	325.00	12.87	9.77	9.6	12.1	0.008
11.04.2023		0.79	321.00	11.94	8.98	12.2		0.009
22.04.2023		0.79	322.00	12.42	9.31	11.7		0.009
28.04.2023		0.79	324.00	11.57	8.65	14.8		0.011

Monitored By **Checked by**

J.K.CEMENT WORKS,MANGROL (RAJ.)

STACK EMISSION MONITORING (Particulate Matter)
FOR CEMENT PLANT LINE-III

MONTH : APRIL-2023

Date	Name of Stack	Cross Sectional Area of duct (M2)	Stack Gases Temp. (Kelvin)	Gaes Velocity (in M / Sec.)	Flow of gases (NM3/Sec.)	Dust Conc. (Mg/NM3)	Mean Dust Conc. (Mg/NM3)	Emission (Tons/Day)
07.04.2023	KILN-3 BAG HOUSE	12.56	394.00	14.35	136.32	12.8	10.0	0.151
11.04.2023		12.56	391.00	14.86	142.25	7.3		0.090
17.04.2023		12.56	399.00	15.81	148.31	11.7		0.150
24.04.2023		12.56	389.00	15.08	145.10	8.2		0.103
08.04.2023	COOLER ESP -3	9.61	372.00	5.09	47.79	17.2	14.6	0.071
14.04.2023		9.61	374.00	4.34	40.88	14.8		0.052
22.04.2023		9.61	371.00	4.64	43.42	13.1		0.049
29.04.2023		9.61	378.00	4.99	46.85	13.2		0.053
07.04.2023	COAL MILL-3	3.94	335.00	8.98	34.68	12.2	12.3	0.037
11.04.2023		3.94	342.00	8.24	31.72	10.7		0.029
17.04.2023		3.94	339.00	7.63	29.28	13.4		0.034
24.04.2023		3.94	340.00	10.56	40.39	12.9		0.045
08.04.2023	CEMENT MILL-4	6.15	367.00	10.78	64.78	7.7	11.4	0.043
13.04.2023		6.15	362.00	11.64	70.17	9.6		0.058
21.04.2023		6.15	370.00	12.69	76.00	13.9		0.091
28.04.2023		6.15	375.00	13.35	80.22	14.2		0.098

Monitored By **Checked by**

J.K.CEMENT WORKS,MANGROL (RAJ.)

STACK EMISSION MONITORING (Particulate Matter)
FOR CEMENT PLANT LINE-I

MONTH : May-2023

Date	Name of Stack	Cross Sectional Area of duct (M2)	Stack Gases Temp. (Kelvin)	Gaes Velocity (M / Sec.)	Flow of gases (NM3/Sec.)	Dust Conc. (Mg/Nm3)	Mean Dust Conc. (Mg/Nm3)	Emission (Tons/Day)
04.05.2023	LSCRUSHER - 1 BAG FILTER	0.38	324	8.97	3.14	9.9	14.5	0.003
10.05.2023		0.38	325	12.20	4.30	15.1		0.006
17.05.2023		0.38	327	10.95	3.79	13.7		0.004
25.05.2023		0.38	326	9.85	3.42	19.4		0.006
05.05.2023	KILN No.1 BAG HOUSE	5.23	401	15.36	59.70	9.6	11.7	0.050
11.05.2023		5.23	403	14.56	56.31	12.2		0.059
17.05.2023		5.23	388	13.86	55.67	14.0		0.067
24.05.2023		5.23	393	15.69	62.22	11.0		0.059
03.05.2023	COOLER ESP -1	7.07	391	8.95	60.24	14.5	13.4	0.075
09.05.2023		7.07	393	9.71	64.94	11.7		0.066
16.05.2023		7.07	392	10.38	69.65	10.0		0.060
23.05.2023		7.07	394	8.55	57.19	17.3		0.085
05.05.2023	COAL MILL - 1 BAG FILTER	0.45	338	15.24	6.51	9.4	10.5	0.005
11.05.2023		0.45	337	16.86	7.22	12.7		0.008
17.05.2023		0.45	341	18.19	7.74	10.9		0.007
24.05.2023		0.45	335	15.09	6.47	9.1		0.005
STOPPED	CEMENT MILL No. - 1 BF	STOP						
01.05.2023	CEMENT MILL No. - 2 BF	0.50	369.00	15.22	7.51	16.5	14.1	0.010
08.05.2023		0.50	361.00	15.53	7.61	16.7		0.007
16.05.2023		0.50	370.00	14.98	7.32	11.2		0.006
26.05.2023		0.50	365.00	14.95	7.23	11.8		0.008

Monitored By **Checked by**

JKCement

J.K.CEMENT WORKS,MANGROL (RAJ.)

STACK EMISSION MONITORING (Particulate Matter)
FOR CEMENT PLANT LINE-II

MONTH : May-2023

Date	Name of Stack	Cross Sectional Area of duct (M2)	Stack Gases Temp. (Kelvin)	Gaes Velocity (M / Sec.)	Flow of gases (NM3/Sec.)	Dust Conc. (Mg/Nm3)	Mean Dust Conc. (Mg/Nm3)	Emission (Tons/Day)
06.05.2023	LSCRUSHER - 2 BAG FILTER	1.23	335	12.64	13.83	16.0	16.4	0.019
12.05.2023		1.23	337	13.37	14.54	14.3		0.018
19.05.2023		1.23	341	13.88	14.92	15.8		0.020
26.05.2023		1.23	345	14.38	15.28	19.5		0.026
06.05.2023	KILN No.2 BAG HOUSE	14.18	414.00	14.71	150.14	7.8	8.4	0.101
13.05.2023		14.18	412.00	14.99	153.74	8.2		0.109
20.05.2023		14.18	415.00	12.35	125.75	8.6		0.093
27.05.2023		14.18	409.00	13.89	143.51	8.8		0.109
04.05.2023	COOLER ESP -2	8.80	390.00	4.78	39.79	10.9	13.3	0.037
10.05.2023		8.80	394.00	5.26	43.93	16.8		0.064
18.05.2023		8.80	398.00	5.44	45.43	11.8		0.046
22.05.2023		8.80	399.00	4.14	34.69	13.5		0.040
06.05.2023	COAL MILL - 2 BAG FILTER	2.00	345.00	9.46	17.90	9.4	11.9	0.015
13.05.2023		2.00	344.00	10.81	20.58	12.5		0.022
20.05.2023		2.00	347.00	9.42	17.88	13.9		0.021
27.05.2023		2.00	339.00	9.99	19.02	11.8		0.019
02.05.2023	CEMENT MILL No. -3 BF	6.60	371.00	11.10	69.31	9.3	9.8	STOP
11.05.2023		6.60	374.00	11.59	72.60	7.9		0.050
15.05.2023		6.60	368.00	9.36	59.00	10.2		0.052
26.05.2023		6.60	371.00	10.43	65.54	11.6		0.066
09.05.2023	PACKER BF-1 (L-2)	0.79	327.00	5.39	4.00	18.5	13.2	0.006
17.05.2023		0.79	327.00	4.77	3.55	10.2		0.003
24.05.2023		0.79	326.00	4.89	3.63	14.5		0.005
31.05.2023		0.79	328.00	5.63	4.21	9.6		0.003
04.05.2023	PACKER BF-2 (L-2)	0.79	323.00	5.12	3.80	15.0	15.1	0.005
12.05.2023		0.79	324.00	6.89	5.13	16.0		0.007
19.05.2023		0.79	325.00	6.03	4.46	16.5		0.006
26.05.2023		0.79	326.00	7.36	5.45	13.0		0.006
04.05.2023	PACKER BF-3	0.79	327.00	6.89	5.16	9.2	10.7	0.004
12.05.2023		0.79	328.00	5.81	4.34	9.8		0.004
19.05.2023		0.79	327.00	6.61	4.95	13.4		0.006
26.05.2023		0.79	328.00	6.43	4.83	10.4		0.004
05.05.2023	PACKER BF- 4	0.79	326.00	6.04	4.50	16.2	14.1	0.006
12.05.2023		0.79	327.00	6.36	4.75	15.1		0.006
19.05.2023		0.79	328.00	4.36	3.24	12.0		0.003
29.05.2023		0.79	327.00	5.27	3.94	13.0		0.004

Monitored By **Checked by**

J.K.CEMENT WORKS,MANGROL (RAJ.)

STACK EMISSION MONITORING (Particulate Matter)
FOR CEMENT PLANT LINE-III

MONTH : May-2023

Date	Name of Stack	Cross Sectional Area of duct (M2)	Stack Gases Temp. (Kelvin)	Gaes Velocity (in M / Sec.)	Flow of gases (NM3/Sec.)	Dust Conc. (Mg/NM3)	Mean Dust Conc. (Mg/NM3)	Emission (Tons/Day)
05.05.2023	KILN-3 BAG HOUSE	12.56	400.00	14.61	136.71	8.3	9.3	0.098
12.05.2023		12.56	393.00	13.95	132.86	9.4		0.108
18.05.2023		12.56	404.00	14.47	134.06	11.6		0.134
25.05.2023		12.56	401.00	14.79	138.05	7.7		0.092
06.05.2023	COOLER ESP -3	9.61	386.00	4.23	38.46	17.5	18.2	0.058
11.05.2023		9.61	381.00	4.70	42.73	20.8		0.077
19.05.2023		9.61	378.00	4.36	39.76	13.2		0.045
27.05.2023		9.61	380.00	4.54	41.54	21.1		0.076
05.05.2023	COAL MILL-3	3.94	337.00	12.86	48.09	8.7	10.3	0.036
12.05.2023		3.94	341.00	13.26	49.58	9.7		0.042
15.05.2023		3.94	339.00	12.50	46.89	12.0		0.049
26.05.2023		3.94	342.00	13.47	50.53	10.8		0.047
02.05.2023	CEMENT MILL-4	6.15	370.00	13.07	76.53	9.9	9.2	0.065
08.05.2023		6.15	361.00	12.75	74.42	12.0		0.077
17.05.2023		6.15	369.00	13.32	77.50	9.1		0.061
24.05.2023		6.15	370.00	12.28	71.45	5.6		0.035

Monitored By **Checked by**

J.K.CEMENT WORKS,MANGROL (RAJ.)

STACK EMISSION MONITORING (Particulate Matter)
FOR CEMENT PLANT LINE-I

MONTH : June-2023

Date	Name of Stack	Cross Sectional Area of duct (M2)	Stack Gases Temp. (Kelvin)	Gaes Velocity (M / Sec.)	Flow of gases (NM3/Sec.)	Dust Conc. (Mg/Nm3)	Mean Dust Conc. (Mg/Nm3)	Emission (Tons/Day)
05.06.2023	LSCRUSHER - 1 BAG FILTER	0.38	324	11.34	3.96	19.0	15.2	0.007
12.06.2023		0.38	325	12.00	4.23	12.1		0.004
20.06.2023		0.38	327	12.34	4.27	15.0		0.006
27.06.2023		0.38	326	10.29	3.57	14.5		0.004
STOPPED	KILN No.1 BAG HOUSE	0.00	0	0.00	0.00	0.0	14.7	0.000
13.06.2023		5.23	398	17.59	68.88	11.4		0.068
19.06.2023		5.23	404	18.29	70.56	15.0		0.091
26.06.2023		5.23	401	19.14	74.39	17.7		0.114
STOPPED	COOLER ESP -1	0.00	0.00	0.00	0.00	0.0	17.2	0.000
13.06.2023		7.07	399	8.87	59.33	20.2		0.104
20.06.2023		7.07	398	8.69	58.31	16.9		0.085
27.06.2023		7.07	395	7.62	50.97	14.5		0.064
STOPPED	COAL MILL - 1 BAG FILTER	0.00	0.00	0.00	0.00	0.0	11.1	0.000
13.06.2023		0.45	338	15.49	6.64	13.8		0.008
19.06.2023		0.45	339	13.22	5.63	10.2		0.005
26.06.2023		0.45	340	16.19	6.94	9.3		0.006
STOPPED	**CEMENT MILL No. - 1 BF**	**STOP**						
02.06.2023	CEMENT MILL No. - 2 BF	0.50	358.00	15.22	7.51	14.8	12.4	0.010
09.06.2023		0.50	359.00	15.53	7.61	10.3		0.007
15.06.2023		0.50	362.00	14.98	7.32	11.0		0.006
22.06.2023		0.50	363.00	14.95	7.23	13.6		0.008

Monitored By **Checked by**

JKCement

J.K.CEMENT WORKS,MANGROL (RAJ.)

STACK EMISSION MONITORING (Particulate Matter)
FOR CEMENT PLANT LINE-II

MONTH : June-2023

Date	Name of Stack	Cross Sectional Area of duct (M2)	Stack Gases Temp. (Kelvin)	Gaes Velocity (M / Sec.)	Flow of gases (NM3/Sec.)	Dust Conc. (Mg/Nm3)	Mean Dust Conc. (Mg/Nm3)	Emission (Tons/Day)
02.06.2023	LSCRUSHER - 2 BAG FILTER	1.23	339	12.79	13.83	10.5	13.6	0.013
10.06.2023		1.23	337	12.58	13.68	11.8		0.014
22.06.2023		1.23	340	13.19	14.22	13.9		0.017
29.06.2023		1.23	337	13.66	14.86	18.3		0.023
08.06.2023	KILN No.2 BAG HOUSE	14.18	410.00	11.54	118.94	8.7	7.6	0.089
13.06.2023		14.18	409.00	12.33	127.39	6.4		0.070
20.06.2023		14.18	412.00	11.78	120.82	7.4		0.077
29.06.2023		14.18	405.00	11.34	118.32	7.8		0.080
06.06.2023	COOLER ESP -2	8.80	388.00	4.44	37.20	17.9	14.0	0.058
12.06.2023		8.80	387.00	4.92	41.09	15.1		0.054
19.06.2023		8.80	389.00	5.65	47.49	12.9		0.053
29.06.2023		8.80	388.00	5.22	43.73	9.9		0.037
08.06.2023	COAL MILL - 2 BAG FILTER	2.00	334.00	12.42	23.73	17.9	15.7	0.037
13.06.2023		2.00	335.00	12.29	23.40	18.7		0.038
20.06.2023		2.00	339.00	12.57	24.09	14.1		0.029
29.06.2023		2.00	336.00	12.88	24.60	12.2		0.026
03.06.2023	CEMENT MILL No. -3 BF	6.60	367.00	12.27	77.35	14.1	14.4	STOP
12.06.2023		6.60	369.00	12.71	79.87	11.4		0.079
20.06.2023		6.60	371.00	14.14	89.42	17.3		0.134
28.06.2023		6.60	364.00	11.68	73.63	14.9		0.095
08.06.2023	PACKER BF-1 (L-2)	0.79	326.00	10.99	8.27	13.1	14.4	0.009
17.06.2023		0.79	324.00	11.46	8.56	16.7		0.012
24.06.2023		0.79	323.00	11.82	8.86	14.9		0.011
30.06.2023		0.79	325.00	10.33	7.72	12.9		0.009
09.06.2023	PACKER BF-2 (L-2)	0.79	323.00	11.39	8.51	12.6	9.6	0.009
16.06.2023		0.79	323.00	12.54	9.40	7.5		0.006
22.06.2023		0.79	325.00	12.12	9.06	8.8		0.007
30.06.2023		0.79	326.00	11.39	8.51	9.4		0.007
08.06.2023	PACKER BF-3	0.79	322.00	9.79	7.39	9.0	8.2	0.006
17.06.2023		0.79	323.00	10.30	7.74	7.2		0.005
24.06.2023		0.79	324.00	10.84	8.12	9.8		0.007
30.06.2023		0.79	325.00	10.45	7.85	6.8		0.005
09.06.2023	PACKER BF- 4	0.79	324.00	12.24	9.15	8.9	9.1	0.007
16.06.2023		0.79	323.00	12.83	9.59	7.0		0.006
22.06.2023		0.79	324.00	12.51	9.35	8.1		0.007
30.06.2023		0.79	322.00	11.59	8.63	12.2		0.009

Monitored By **Checked by**

J.K.CEMENT WORKS,MANGROL (RAJ.)

STACK EMISSION MONITORING (Particulate Matter)
FOR CEMENT PLANT LINE-III

MONTH : June-2023

Date	Name of Stack	Cross Sectional Area of duct (M2)	Stack Gases Temp. (Kelvin)	Gaes Velocity (in M / Sec.)	Flow of gases (NM3/Sec.)	Dust Conc. (Mg/NM3)	Mean Dust Conc. (Mg/NM3)	Emission (Tons/Day)
02.06.2023	KILN-3 BAG HOUSE	12.56	388.00	14.18	136.79	14.3	14.8	0.169
08.06.2023		12.56	393.00	13.73	130.76	15.2		0.172
15.06.2023		12.56	389.00	14.46	139.13	13.9		0.167
21.06.2023		12.56	390.00	13.84	132.82	15.9		0.182
05.06.2023	COOLER ESP -3	9.61	371.00	4.48	40.99	14.1	15.4	0.050
14.06.2023		9.61	377.00	4.35	39.67	16.4		0.056
20.06.2023		9.61	374.00	4.17	38.15	14.4		0.047
26.06.2023		9.61	370.00	4.79	43.83	16.6		0.063
02.06.2023	COAL MILL-3	3.94	336.00	13.26	49.58	14.3	12.0	0.061
08.06.2023		3.94	337.00	13.62	50.93	10.9		0.048
15.06.2023		3.94	337.00	12.98	48.69	11.6		0.049
21.06.2023		3.94	338.00	12.48	46.81	11.3		0.046
08.06.2023	CEMENT MILL-4	6.15	371.00	8.91	52.34	9.2	8.1	0.042
12.06.2023		6.15	372.00	9.46	55.39	6.9		0.033
21.06.2023		6.15	371.00	10.03	58.54	7.2		0.036
30.06.2023		6.15	368.00	11.05	65.12	9.1		0.051

Monitored By **Checked by**

J.K.CEMENT WORKS,MANGROL (RAJ.)

STACK EMISSION MONITORING (Particulate Matter)
FOR CEMENT PLANT LINE-I

MONTH : JULY 2023

Date	Name of Stack	Cross Sectional Area of duct (M2)	Stack Gases Temp. (Kelvin)	Gaes Velocity (M / Sec.)	Flow of gases (NM3/Sec.)	Dust Conc. (Mg/NM3)	Mean Dust Conc (Mg/NM3)	Emission (Tons/Day)
04.07.2023	LSCRUSHER - 1 BAG FILTER	0.38	327	11.06	3.83	19.5	19.4	0.006
11.07.2023		0.38	325	10.86	3.83	22.9		0.008
18.07.2023		0.38	328	12.21	4.22	19.0		0.007
31.07.2023		0.38	324	9.82	3.43	16.3		0.005
04.07.2023	KILN No.1 BAG HOUSE	5.23	0	15.89	61.45	9.7	11.5	0.052
11.07.2023		5.23	401	15.66	60.86	12.3		0.065
18.07.2023		5.23	405	14.60	56.18	10.6		0.051
31.07.2023		5.23	402	14.70	56.99	13.4		0.066
04.07.2023	COOLER ESP -1	7.07	0.00	8.93	60.11	12.2	14.2	0.063
11.07.2023		7.07	398	9.29	62.33	15.0		0.081
18.07.2023		7.07	394	10.26	68.19	12.9		0.076
31.07.2023		7.07	393	10.02	67.02	16.6		0.096
05.07.2023	COAL MILL - 1 BAG FILTER	#REF!	0.00	#REF!	#REF!	#REF!	12.0	0.008
13.07.2023		0.45	339	16.43	7.06	13.3		0.026
20.07.2023		0.45	337	15.84	6.76	11.8		0.007
28.07.2023		0.45	339	15.76	6.80	10.0		0.006
STOPPED	CEMENT MILL No. - 1 BF	STOP						
05.07.2023	CEMENT MILL No. - 2 BF	0.50	361.00	15.22	7.51	17.1	15.7	0.010
13.07.2023		0.50	363.00	15.53	7.61	18.9		0.007
20.07.2023		0.50	359.00	14.98	7.32	15.1		0.006
28.07.2023		0.50	362.00	14.95	7.23	11.5		0.008

Monitored By

Checked by

J.K.CEMENT WORKS,MANGROL (RAJ.)

STACK EMISSION MONITORING (Particulate Matter)
FOR CEMENT PLANT LINE-II

MONTH : JULY 2023

Date	Name of Stack	Cross Sectional Area of duct (M2)	Stack Gases Temp. (Kelvin)	Gaes Velocity (M / Sec.)	Flow of gases (NM3/Sec.)	Dust Conc. (Mg/NM3)	Mean Dust Conc (Mg/NM3)	Emission (Tons/Day)
05.07.2023	LSCRUSHER - 2 BAG FILTER	1.23	337	13.12	14.27	15.4	15.1	0.019
13.07.2023		1.23	341	13.49	14.50	13.1		0.016
20.07.2023		1.23	339	13.11	14.18	16.2		0.020
28.07.2023		2.23	340	13.62	26.62	15.8		0.036
03.07.2023	KILN No.2 BAG HOUSE	14.18	408.00	13.47	139.51	12.3	10.2	0.148
10.07.2023		14.18	411.00	14.16	145.58	9.8		0.123
21.07.2023		14.18	414.00	13.45	137.28	8.2		0.097
29.07.2023		15.18	415.00	14.05	153.15	10.4		0.138
03.07.2023	COOLER ESP -2	8.80	389.00	5.33	44.80	11.5	12.3	0.045
10.07.2023		8.80	386.00	4.25	35.61	8.4		0.026
21.07.2023		8.80	388.00	5.08	42.84	12.8		0.047
29.07.2023		9.80	389.00	5.51	51.58	16.6		0.074
03.07.2023	COAL MILL - 2 BAG FILTER	2.00	336.00	9.91	18.87	11.8	12.1	0.019
10.07.2023		2.00	338.00	10.55	20.22	8.8		0.015
21.07.2023		2.00	341.00	9.75	18.51	15.6		0.025
29.07.2023		3.00	343.00	10.80	30.65	12.1		0.032
03.07.2023	CEMENT MILL No. -3 BF	6.60	369.00	10.94	69.19	11.7	13.2	0.070
10.07.2023		6.60	372.00	11.31	71.30	12.2		0.075
21.07.2023		6.60	366.00	11.47	71.84	16.2		0.101
28.07.2023		6.60	368.00	11.75	73.83	12.5		0.080
01.07.2023	PACKER BF-1 (L-2)	0.79	326.00	10.76	8.04	13.3	14.5	0.009
08.07.2023		0.79	324.00	11.52	8.67	12.9		0.010
14.07.2023		0.79	325.00	11.09	8.26	17.1		0.012
27.07.2023		0.79	323.00	11.33	8.49	14.7		0.011
04.07.2023	PACKER BF-2 (L-2)	0.79	322.00	11.37	8.50	16.7	16.2	0.012
12.07.2023		0.79	323.00	12.54	9.37	17.6		0.014
25.07.2023		0.79	324.00	12.10	9.04	16.6		0.013
31.07.2023		0.79	325.00	11.37	8.47	14.0		0.010
04.07.2023	PACKER BF-3	0.79	324.00	10.07	7.57	11.7	12.5	0.008
12.07.2023		0.79	323.00	10.99	8.32	10.9		0.008
25.07.2023		0.79	324.00	11.45	8.58	12.8		0.009
31.07.2023		0.79	322.00	10.40	7.84	14.5		0.010
04.07.2023	PACKER BF- 4	0.79	324.00	12.24	9.21	15.5	11.7	0.012
12.07.2023		0.79	323.00	12.83	9.62	9.0		0.007
25.07.2023		0.79	324.00	12.51	9.32	12.1		0.010
31.07.2023		0.79	322.00	11.59	8.66	10.3		0.008

Monitored By

Checked by

J.K.CEMENT WORKS,MANGROL (RAJ.)

STACK EMISSION MONITORING (Particulate Matter)
FOR CEMENT PLANT LINE-III

MONTH : JULY 2023

Date	Name of Stack	Cross Sectional Area of duct (M2)	Stack Gases Temp. (Kelvin)	Gaes Velocity (M / Sec.)	Flow of gases (NM3/Sec.)	Dust Conc. (Mg/NM3)	Mean Dust Conc (Mg/NM3)	Emission (Tons/Day)
03.07.2023	KILN-3 BAG HOUSE	12.56	389.00	14.51	139.61	12.6	11.0	0.152
10.07.2023		12.56	386.00	15.17	147.10	9.2		0.117
17.07.2023		12.56	388.00	14.45	139.39	11.2		0.135
00-01-1900		0.00	0.00	0.00	0.00	0.0		0.000
03.07.2023	COOLER ESP -3	9.61	375.00	5.52	50.51	9.6	9.2	0.042
10.07.2023		9.61	372.00	6.12	55.82	9.7		0.047
17.07.2023		9.61	378.00	5.80	53.24	8.3		0.038
00-01-1900		0.00	0.00	0.00	0.00	0.0		0.000
03.07.2023	COAL MILL-3	3.94	334.00	10.96	41.24	9.6	12.0	0.034
10.07.2023		3.94	336.00	10.81	40.42	15.7		0.055
17.07.2023		3.94	338.00	10.21	38.55	10.8		0.036
00-01-1900		0.00	0.00	0.00	0.00	0.0		0.000
05.07.2023	CEMENT MILL-4	6.15	370.00	10.16	59.87	13.9	12.4	0.072
15.07.2023		6.15	372.00	10.53	61.46	13.8		0.073
21.07.2023		6.15	369.00	11.99	70.43	10.2		0.062
31.07.2023		6.15	370.00	11.69	68.45	11.8		0.070

Monitored By **Checked by**

JKCement

J.K.CEMENT WORKS,MANGROL (RAJ.)

STACK EMISSION MONITORING (Particulate Matter)
FOR CEMENT PLANT LINE-I

MONTH : AUGUST 2023

Date	Name of Stack	Cross Sectional Area of duct (M2)	Stack Gases Temp. (Kelvin)	Gaes Velocity (M / Sec.)	Flow of gases (NM3/Sec.)	Dust Conc. (Mg/Nm3)	Mean Dust Conc. (Mg/Nm3)	Emission (Tons/Day)
03.08.2023	LSCRUSHER - 1 BAG FILTER	0.38	326	9.69	3.37	13.8	12.4	0.003
11.08.2023		0.38	324	9.29	3.25	11.6		0.004
17.08.2023		0.38	323	8.52	2.99	14.0		0.003
25.08.2023		0.38	324	8.41	2.94	10.3		0.004
11.08.2023	KILN No.1 BAG HOUSE	5.23	401	16.19	62.92	11.6	13.1	0.063
17.08.2023		5.23	397	15.38	60.38	15.8		0.082
25.08.2023		5.23	403	15.34	59.33	17.9		0.092
13.08.2023	COOLER ESP -1	7.07	401	9.07	61.44	9.8	12.1	0.052
23.08.2023		7.07	394	8.37	56.34	12.6		0.061
30.08.2023		7.07	393	8.54	57.67	11.9		0.059
13.08.2023	COAL MILL - 1 BAG FILTER	0.45	342	15.46	6.60	11.3	11.3	0.006
23.08.2023		0.45	337	16.20	6.96	12.6		0.008
30.08.2023		0.45	339	16.13	6.91	11.2		0.007
STOPPED	CEMENT MILL No. - 1 BF	STOPPED						
05.08.2023	CEMENT MILL No. - 2 BF	0.50	360.00	15.22	7.51	17.4	14.9	0.011
13.08.2023		0.50	357.00	15.53	7.61	12.9		0.008
23.08.2023		0.50	362.00	14.98	7.32	13.2		0.008
30.08.2023		0.50	363.00	14.95	7.23	15.9		0.010

Monitored By **Checked by**

JKCement

J.K.CEMENT WORKS,MANGROL (RAJ.)

STACK EMISSION MONITORING (Particulate Matter)
FOR CEMENT PLANT LINE-II

MONTH : AUGUST 2023

Date	Name of Stack	Cross Sectional Area of Duct (M2)	Stack Gases Temp. (Kelvin)	Gaes Velocity (M / Sec.)	Flow of gases (NM3/Sec.)	Dust Conc. (Mg/NM3)	Mean Dust Conc. (Mg/NM3)	Emission (Tons/Day)
02.08.2023	LSCRUSHER - 2 BAG FILTER	1.23	341	13.11	14.09	12.7	14.7	0.015
10.08.2023		1.23	339	12.87	13.92	16.0		0.019
22.08.2023		1.23	336	13.31	14.52	15.9		0.020
29.08.2023		1.23	342	13.57	14.54	14.1		0.018
STOPPED	KILN No.2 BAG HOUSE	STOPPED						
STOPPED	COOLER ESP -2	STOPPED						
STOPPED	COAL MILL - 2 BAG FILTER	STOPPED						
03.08.2023	CEMENT MILL No. -3 BF	6.60	371.00	11.80	74.62	11.8	11.4	STOP
12.08.2023		6.60	372.00	11.56	72.87	12.6		0.079
21.08.2023		6.60	371.00	10.90	68.27	9.6		0.057
28.08.2023		6.60	368.00	11.25	70.69	11.6		0.071
02.08.2023	PACKER BF-1 (L-2)	0.79	323.00	5.71	4.28	18.3	13.5	0.007
09.08.2023		0.79	325.00	4.96	3.71	11.6		0.004
16.08.2023		0.79	324.00	5.42	4.04	13.7		0.005
26.08.2023		0.79	322.00	4.73	3.54	10.4		0.003
03.08.2023	PACKER BF-2 (L-2)	0.79	324.00	5.38	4.02	18.1	16.0	0.006
12.08.2023		0.79	323.00	6.70	5.02	13.4		0.006
21.08.2023		0.79	324.00	5.70	4.26	15.5		0.006
28.08.2023		0.79	322.00	6.31	4.72	17.1		0.007
02.08.2023	PACKER BF-3	0.79	323.00	6.48	4.87	11.0	12.6	0.005
09.08.2023		0.79	323.00	6.85	5.16	12.8		0.006
16.08.2023		0.79	322.00	5.92	4.45	11.6		0.004
26.08.2023		0.79	325.00	5.64	4.24	14.9		0.005
03.08.2023	PACKER BF- 4	0.79	322.00	6.31	4.70	12.6	13.7	0.005
12.08.2023		0.79	323.00	6.70	5.01	11.2		0.005
21.08.2023		0.79	324.00	6.02	4.51	17.8		0.007
28.08.2023		0.79	325.00	5.49	4.10	13.0		0.005

Monitored By **Checked by**

J.K.CEMENT WORKS,MANGROL (RAJ.)

STACK EMISSION MONITORING (Particulate Matter)
FOR CEMENT PLANT LINE-III

MONTH : AUGUST 2023

Date	Name of Stack	Cross Sectional Area of duct (M2)	Stack Gases Temp. (Kelvin)	Gaes Velocity (M / Sec.)	Flow of gases (NM3/Sec.)	Dust Conc. (Mg/NM3)	Mean Dust Conc (Mg/NM3)	Emission (Tons/Day)
29.08.2023	**KILN-3 BAG HOUSE**	12.56	392.00	13.43	128.23	9.0	**9.0**	0.100
29.08.2023	**COOLER ESP -3**	9.61	375.00	4.82	44.10	10.8	**10.8**	0.041
29.08.2023	**COAL MILL-3**	3.94	339.00	12.66	47.49	15.6	**15.6**	0.064
06.08.2023	**CEMENT MILL-4**	6.15	372.00	12.10	71.08	14.6	**13.0**	0.090
12.08.2023		6.15	369.00	12.78	74.59	10.8		0.070
21.08.2023		6.15	372.00	13.11	77.26	11.8		0.079
30.08.2023		6.15	368.00	13.22	77.41	14.6		0.098

Monitored By

Checked by

J.K.CEMENT WORKS,MANGROL (RAJ.)

STACK EMISSION MONITORING (Particulate Matter)
FOR CEMENT PLANT LINE-I

MONTH : SEPTEMBER 2023

Date	Name of Stack	Cross Sectional Area of duct (in M2)	Stack Gases Temp. (in ˚ K)	Gaes Velocity (in M / Sec.)	Flow of gases (in NM3/Sec.)	Dust Conc. (Mg/Nm3)	Mean Dust Conc.(in Mg/Nm3)	Emission (in Ts/Day)	Remarks
00-01-1900	LSCRUSHER - 1 BAG FILTER	0.38	325	12.14	4.23	12.1	12.1	0.004	
STOPPED	KILN No.1 BAG HOUSE	STOPPED							
STOPPED	COOLER ESP -1	STOPPED							
STOPPED	COAL MILL - 1 BAG FILTER	STOPPED							
STOPPED	CEMENT MILL No. - 1 BF	STOPPED							
02.09.2023	CEMENT MILL No. - 2 BF	0.50	361.00	14.19	6.75	13.7	12.5	0.008	
09.09.2023		0.50	357.00	14.25	6.83	12.2		0.007	
16.09.2023		0.50	360.00	15.11	7.17	11.5		0.007	
24.09.2023		0.50	362.00	15.01	7.15	12.4		0.008	

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J.K.CEMENT WORKS,MANGROL (RAJ.)

STACK EMISSION MONITORING (Particulate Matter)
FOR CEMENT PLANT LINE-II

MONTH : SEPTEMBER 2023

Date	Name of Stack	Cross Sectional Area of Duct (in M2)	Stack Gases Temp. (in ˚ K)	Gaes Velocity (in M / Sec.)	Flow of gases (in NM3/Sec.)	Dust Conc. (Mg/NM3)	Mean Dust Conc.(in Mg/NM3)	Emission (in Ts/Day)	Remarks
02.09.2023	LSCRUSHER - 2 BAG FILTER	1.23	341	13.11	14.09	13.7	14.7	0.017	
09.09.2023		1.23	336	13.35	14.56	14.1		0.018	
16.09.2023		1.23	340	13.19	14.22	12.9		0.016	
24.09.2023		1.23	338	13.44	14.57	17.9		0.023	
02.09.2023	KILN No.2 BAG HOUSE	14.18	411.00	11.69	120.19	9.3	10.1	0.097	
09.09.2023		14.18	407.00	12.67	131.55	6.8		0.077	
16.09.2023		14.18	409.00	11.80	121.91	15.1		0.159	
24.09.2023		14.18	405.00	12.83	133.86	9.0		0.104	
04.09.2023	COOLER ESP -2	8.80	389.00	4.61	38.50	11.5	11.8	0.038	
12.09.2023		8.80	390.00	5.66	47.73	12.3		0.051	
19.09.2023		8.80	387.00	4.92	41.22	14.0		0.050	
29.09.2023		8.80	386.00	5.06	42.26	9.5		0.035	
04.09.2023	COAL MILL - 2 BAG FILTER	2.00	337.00	12.68	24.07	12.0	13.8	0.025	
12.09.2023		2.00	334.00	11.46	21.96	14.2		0.027	
19.09.2023		2.00	338.00	12.65	24.09	11.4		0.024	
29.09.2023		2.00	335.00	11.57	21.96	17.4		0.033	
04.09.2023	CEMENT MILL No. -3 BF	6.60	369.00	12.48	78.42	12.3	14.6	0.083	
12.09.2023		6.60	364.00	12.45	78.74	18.5		0.126	
19.09.2023		6.60	366.00	13.84	86.69	11.5		0.086	
29.09.2023		6.60	370.00	12.55	78.86	16.2		0.110	
05.09.2023	PACKER BF-1 (L-2)	0.79	324.00	11.30	8.45	11.5	10.7	0.008	
11.09.2023		0.79	323.00	11.44	8.55	12.2		0.009	
18.09.2023		0.79	325.00	12.22	9.16	10.2		0.008	
25.09.2023		0.79	326.00	11.98	8.95	9.0		0.007	
05.09.2023	PACKER BF-2 (L-2)	0.79	322.00	11.37	8.52	11.9	10.8	0.009	
11.09.2023		0.79	323.00	12.39	9.26	10.6		0.008	
18.09.2023		0.79	324.00	12.10	9.10	8.9		0.007	
25.09.2023		0.79	325.00	11.37	8.50	11.7		0.009	
06.09.2023	PACKER BF-3	0.79	324.00	10.01	7.53	10.4	9.1	0.007	
14.09.2023		0.79	323.00	10.48	7.88	7.0		0.005	
20.09.2023		0.79	324.00	10.84	8.15	8.3		0.006	
28.09.2023		0.79	322.00	10.58	7.93	10.5		0.007	
06.09.2023	PACKER BF- 4	0.79	323.00	12.22	9.16	12.5	10.5	0.010	
14.09.2023		0.79	322.00	12.66	9.43	10.9		0.009	
20.09.2023		0.79	324.00	13.00	9.72	7.8		0.007	
28.09.2023		0.79	322.00	13.10	9.76	10.9		0.009	

Monitored By **Checked by**

J.K.CEMENT WORKS,MANGROL (RAJ.)

STACK EMISSION MONITORING (Particulate Matter)
FOR CEMENT PLANT LINE-II

MONTH : SEPTEMBER 2023

Date	Name of Stack	Cross Sectional Area of duct (in M2)	Stack Gases Temp. (in ° K)	Gaes Velocity (in M / Sec.)	Flow of gases (in NM3/Sec.)	Dust Conc. (Mg/NM3)	Mean Dust Conc.(in Mg/NM3)	Emission (in Ts/Day)	Remarks
09.09.2023	KILN-3 BAG HOUSE	12.56	392.00	13.99	133.58	10.8	9.8	0.125	
14.09.2023		12.56	389.00	14.36	138.17	7.8		0.093	
22.09.2023		12.56	393.00	14.17	134.95	8.5		0.099	
30.09.2023		12.56	391.00	14.50	138.80	12.2		0.146	
09.09.2023	COOLER ESP -3	9.61	375.00	4.67	42.59	13.6	16.3	0.050	
14.09.2023		9.61	372.00	4.80	44.06	19.6		0.075	
22.09.2023		9.61	370.00	4.48	40.86	15.4		0.054	
30.09.2023		9.61	374.00	4.96	45.38	16.6		0.065	
03.09.2023	COAL MILL-3	3.94	339.00	13.32	49.97	14.5	11.9	0.063	
11.09.2023		3.94	335.00	13.44	50.26	10.9		0.047	
18.09.2023		3.94	338.00	12.90	48.39	11.6		0.048	
25.09.2023		3.94	336.00	13.21	49.55	10.7		0.046	
03.09.2023	CEMENT MILL-4	6.15	370.00	12.91	75.83	9.2	11.1	0.060	
11.09.2023		6.15	368.00	13.09	76.65	12.4		0.082	
18.09.2023		6.15	371.00	13.36	77.98	10.1		0.068	
25.09.2023		6.15	370.00	13.21	77.35	12.5		0.084	

Monitored By **Checked by**

Sponsor:

JKCement

Cement Division, Unit- Mangrol

Report Prepared by:

Wolkem India Limited

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(QCI/NABET Accredited EIA Consultancy Organization,
NABL Accredited & ISO 17025 Certified Laboratory)

Preface

J.K. CEMENT LIMITED
Cement Division, Unit- Mangrol
June- 2023

Calibration Check Monitoring Report
For
Particulate Matter (PM-CEMS)
Continuous Emission Monitoring System

For and on behalf of Wolkem India Limited

Approved by : Mr. Amreesh Malik

Singed : 

Designation : Head & Dy. GM

Date : 11.07.2023

This report has been prepared by Wolkem India Limited with all reasonable skill, care and diligence within the terms of the contract with the client, incorporating our General Terms and Conditions of Business and taking account of the resources devoted to it by agreement with the client.

We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.

1. Introduction

JK Cement Ltd. is one of India's leading manufacturers of Grey Cement and one of the leading White Cement manufacturers in the World. Over four decades, the Company has partnered India's multi-sectoral infrastructure needs on the strength of its product excellence, customer orientation and technology leadership. JK Cement's operations commenced with commercial production at its flagship grey cement unit at Nimbahera, Rajasthan in May 1975.

The Company has an installed Grey Cement capacity of 15 MTPA as on date, making it one of the top cement manufacturers in the Country. And JK Cement Works, Mangrol is one of the cement manufacturing units of JK Cement Works Ltd., it is situated in Chittorgarh district of Rajasthan, (15 kms from the Nimbahera Plant) the unit commenced Line-1 Commercial production from December 2001 onwards and while for Line-2 & Line-3 commercial production started from May-2014 and September-2019 respectively.

2. Background

Cement, power, chemical, textile and various other industries are indicators of country's progress, however all these industries have adverse impact on environment through emission of pollutants. India, like many other countries, has put in place a regulatory regime to control industrial emissions into air. For industries it is very difficult to follow these regimes due to continuous varying emission level depending on various factors like variation in per day production based on market demand, load, operating hours, season etc. and conventional emission monitoring system represent the emission level of particular time period only.

Continuous emission monitoring system (CEMS) has become necessity to monitor & regulate emission level. CEMS refers to the instrumentation and associated computing hardware and software used to measure pollutant levels in exhaust gas from industrial sources at a higher frequency (e.g., once or more per minute). Most PM CEMS device technologies employ indirect measurement principles and therefore require calibration before use. For instance, light scattering CEMS technology, which is commonly used to measure PM emissions, calculates the concentration of pollutants based on changes in the optical properties of stack gas. Calibration (performance & reliability) of CEMS ensures the complete integrity & reliability of data acquired from CEMS.

JK Cement Ltd, Situated at Kailash Nagar Village, Post. Nimbahera, Chittorgarh District of Rajasthan, has put Particulate matter CEMS (PM- CEMS) for monitoring of particulate matter emission level. Calibration Check of CEMS was performed by M/s Wolkem India Limited, Udaipur. To comply the regulatory requirement M/s Wolkem India Limited was follow Central Pollution Control Board specifications and guidelines for continuous emissions monitoring systems (CEMS) for Particulate Matter (PM) measurement with special reference to emission trading programs (CPCB/e-PUBLICATION/2013-14) and

1st Revised Guidelines for Continuous emission monitoring systems in September 2018. Standard reference method of Iso-kinetic sampling technique was adopted for comparison study of online data received from PM CEMS.

3. Standard Reference Method (SRM)

Particulate matter is withdrawn Iso-kinetically from the duct/stack and collected in a Micro Glass fiber thimble maintained at duct/stack temperature. The particulate matter, which includes any material that collects in the Filter thimble, is determined gravimetrically after the removal of un-combined moisture. The Iso-kinetic flow rate is calculate from the arrived flue gas velocity inside the duct/stack at respective traverse points, which is calculated based on the measured parameters like temperature, moisture, molecular weight, velocity head at respective traverse points and static head.

4. Calibration procedure

Particulate matter emission level of 18 stacks (stationary source of emission) installed in plant was measured by standard reference method of Iso- kinetic sampling technique. Total three measurements were carried out in each stack with changing load of Concern Mills (wherever possible). Micro Glass Fiber Filter thimbles are used for dust collection and were conditioned at 120 °C to constant weighing before & after sampling. Data acquired from PM-CEMS for each stack during Real time period of Iso- kinetic sampling was collected. Since in every study each collected data is associated with some inherent error due to various unavoidable factors, therefore, for comparing both data, regression line graph was made between Iso-kinetic data vs. PM-CEMS data. From this root mean square (RMS), percent root mean square percentage error (%RMSPE), and regression slope (m) intercept factor (C) regression correlation coefficient (R^2) & was calculated. In this study R^2 represents the fitness of data to liner line equation & percent root mean square error for this study indicates the deviation of PM-CEMS data with reference to standard reference method of Iso-kinetic sampling method. As per CPCB/e-Publication/2013-14 guideline, maximum acceptable limit for % RMSPE is less than 30. If % RMSE is more than 30, then factor of m & C needs to apply in CEMS software to get correct data for emission level.

5. Instruments

For this study, Iso-kinetic sampling train for Particulate Matter was carried out in different stacks in JK Cement Ltd. Mangrol, in Chittorgarh District, Rajasthan, by stack sampling kit TEI- 401 of Thermo Environmental Instrument Private Limited. Dust sample was collected in Whatman glass fiber thimbles.

6. Gaseous Composition Measurement

The measurement of the O2, & CO2 was carried out with the Portable Combustion Flue Gas Analyser Make of Kane 900 plus Model.

FIGURE- 1
PORTABLE COMBUSTION GAS ANALYSER

7. Exhaust Gas Volume Stream

7.1 Velocity

The velocity profile was measured using S-type Pitot tube according to USEPA- guideline method no.2.

TABLE- 1
INSTRUMENT DETAILS FOR VELOCITY MEASUREMENT

Parameters	Instrument and Its Specification
S- Type Pitot tube	o Thermo Environmental Stack Sampling Kit o Validated with calibration Report
Dynamic pressure	o Incline cum vertical manometer o Thermo Environmental Stack Sampling Kit o Accuracy: ± 1 [%] of measuring range
Static pressure	o Incline cum vertical manometer o Thermo Environmental Stack Sampling Kit o Accuracy: ± 1 [%] of measuring range

7.2 Exhaust Gas Temperature

During the whole measuring period the temperature of the exhaust gas was measured in multi- points of the cross-section area of the stack with a K type thermocouple in connection with a display unit.

Thermo Environmental Stack Sampling Kit

TABLE- 2

INSTRUMENT DETAILS FOR TEMPERATURE MEASURMENT

Parameters	Instrument and Its Specification
Temperature	Digital Thermo Meter o Range: 0 - 600 [°C] o Accuracy: ± 0.3% + 1°C

8. Measurement of Particulate Matter (PM)

Thermo Iso-kinetic Source Sampling Kit Model TEI- 401 was used to collect dust Sample Iso-kinetically as Per IS: 11255 Part-1 with valid.

Calibration report of Manometer, Orifice Meter, Dry Gas Meter, Sampling Nozzle, Vacuum gauge, Temp indicator, Pitot tube. Sample was collected in Glass Fiber Filter. Hot gas was dried using silica Gel and cooled less than 200 °C before entering to metering Device (Dry Gas Meter). Initial & Final Weight of Filter Thimble was taken at site Laboratory by using Digital Balance.

FIGURE- 2

STACK EMISSION MITORING KIT

9. QA/ QC for Duct Measurement During Sampling

The instruments used for measurement are duly calibrated as per applicable norms as mentioned in ISO/IEC: 17025.

Calibrated S-type Pitot tube, manometer, digital thermometer, Rota meter, dry

gas meter & vacuum gauges were used.

For QA/QC Leak Check was done before & after sampling of each port hole at pressure of (-15) inch Hg & was found 100% leak Proof.

Iso-kineticity percentage was in between 90-110 % at Each Port Hole & over all Iso-kineticity Percentage was also in the same range. Field Blank sample was taken care at site.

10. Results & Discussion

Results obtained from PM-CEMS & Iso-kinetic sampling are summarized in **Table-3** and Regression trend data are given in **Table-4** to **Table-16.**

TABLE- 3
SUMMARY OF REGRESSION ANALYSIS

Sr. No	Stack Identity	PD (%)	C	m	R^2
1	KILN- 01	4.18	0.0008	1.0417	0.9971
2	KILN- 02	3.40	-0.1305	1.0476	0.9098
3	KILN- 03	4.09	2.629	0.8637	0.9723
4	CPP	4.35	0.7911	0.9883	0.9637
5	Cooler Line- 1	3.49	-3.1592	1.5068	0.9472
6	Cooler Line- 2	2.09	3.897	-0.2638	0.9929
7	Cooler Line- 3	2.58	20.211	-0.5061	0.7806
8	Coal Mill- 01	1.84	8.687	-0.4414	0.7626
9	Coal Mill- 02	0.31	1.17	-0.1	0.25
10	Coal Mill- 03	2.05	10.677	-0.0071	0.5025
11	Cement Mill- 02	0.21	1.9129	0.6027	0.9472
12	Cement Mill- 03	2.19	-5.3615	1.5172	0.9576
13	Cement Mill- HRP	3.00	-0.181	1.05	0.9423

Nomenclature:
PD (%) : Allowable Deviation percentage in comparison with SRM Value
M : Regression Slope (correction factor)
C : Intercept Factor
R2 : Correlation Coefficient
NA : Data Not Updated Due to Up-gradation Work

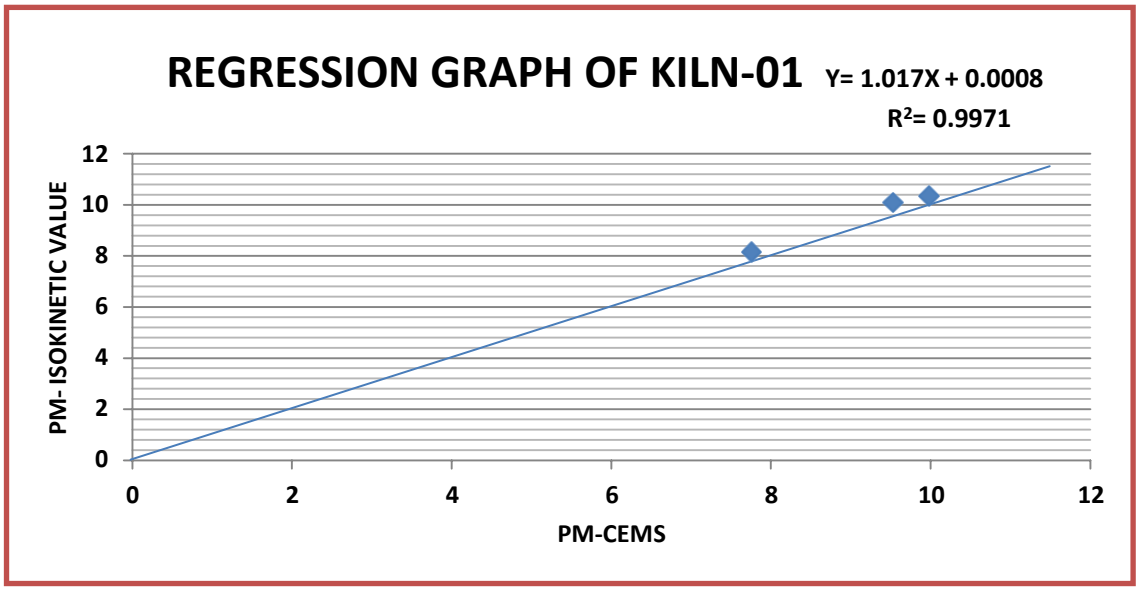
11. Conclusion

From the statistical analysis we found that Performance deviation (%) in Comparison with SRM Data and PM-CEMS data received with real time Monitoring for all stacks are in the range of ±10%. Hence, it is clear that measured data logged through PM-CEMs are in compliance with CPCB 1st Revised Guidelines for Continuous Emission Monitoring Systems June 2018. Based on present study CDF viz. Regression Slope i.e., all CEMs are require to be calibrate.

TABLE- 4

REGRESSION ANALYSIS OF KILN- 01

Regression Analysis



Statistical Data for Regression Analysis

Sr. No.	Particulate Matter (mg/Nm^3)		C	M	R^2	Avg. Performance Accuracy (%)
	Iso- Kinetic Sampling Data	Online CEMS Avg. Data				
1	9.98	10.34	0.0008	1.0417	0.9971	4.18
2	9.53	10.00				
3	7.76	8.07				

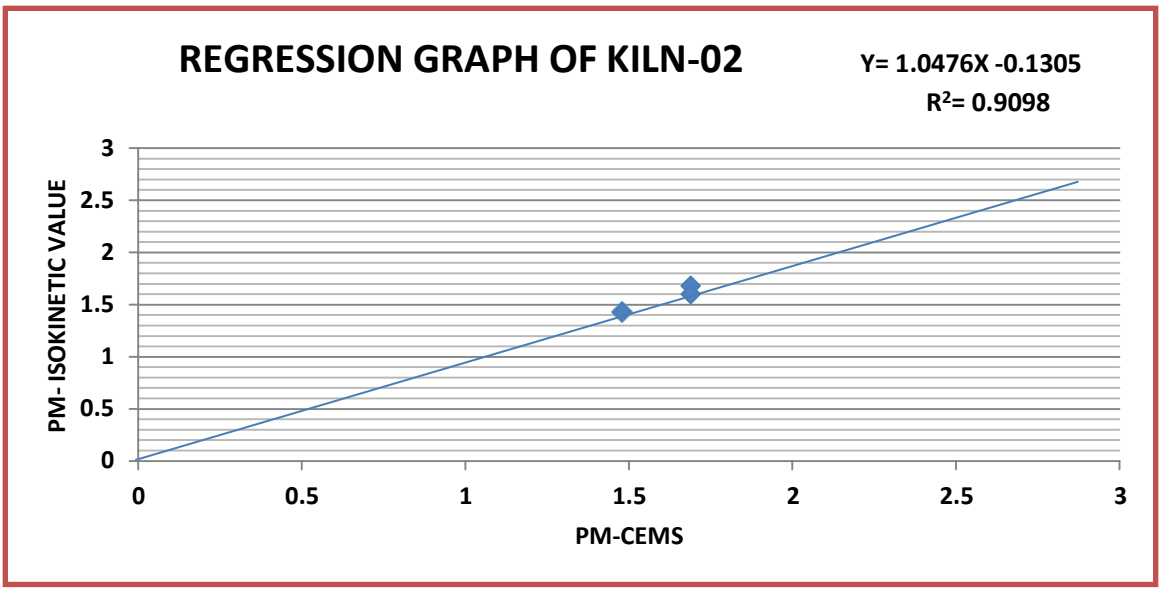
Observation: Installed PM CEMs at **KILN-01** is incompliance as per CPCB 1st Revised Guidelines for Continuous Emission Monitoring Systems June 2018.

Allowable deviation of Performance Accuracy of PM-CEMS during comparison study against SRM should be <±10%.

TABLE- 5

REGRESSION ANALYSIS OF KILN- 02

Regression Analysis



Statistical Data for Regression Analysis

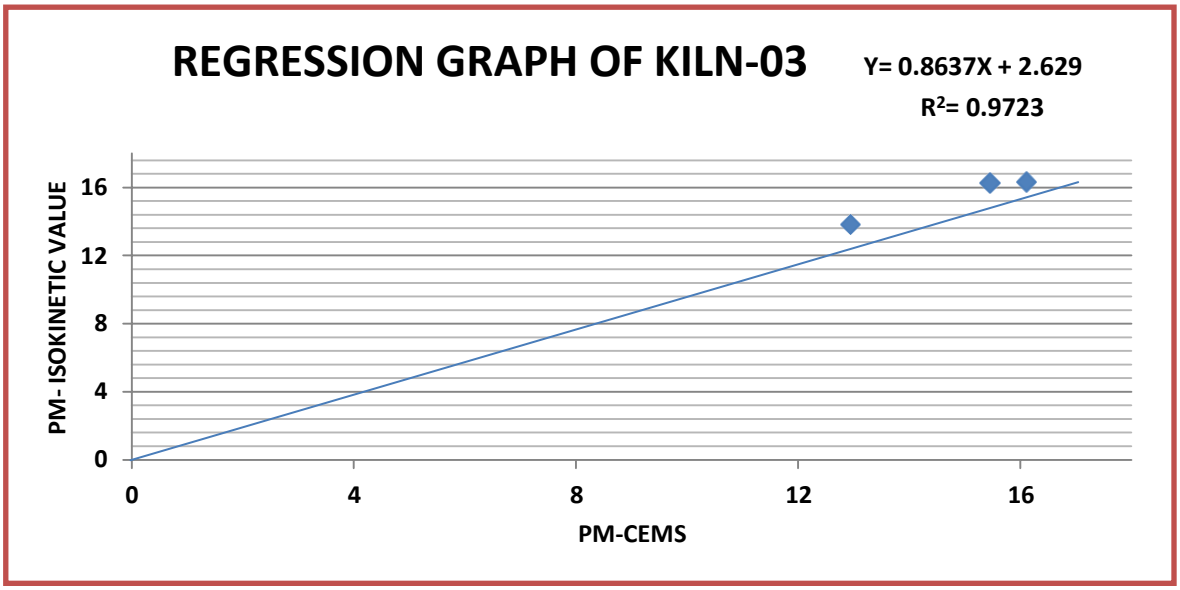
Sr. No.	Particulate Matter (mg/Nm^3)		C	M	R^2	Avg. Performance Accuracy (%)
	Iso- Kinetic Sampling Data	Online CEMS Avg. Data				
1	1.69	1.68	-0.1305	1.0476	0.9098	3.40
2	1.48	1.43				
3	1.69	1.6				

Observation: Installed PM CEMs at **KILN-02** is incompliance as per CPCB 1st Revised Guidelines for Continuous Emission Monitoring Systems June 2018.

Allowable deviation of Performance Accuracy of PM-CEMS during comparison study against SRM should be <±10%.

TABLE- 6
REGRESSION ANALYSIS OF KILN- 03

Regression Analysis



Statistical Data for Regression Analysis

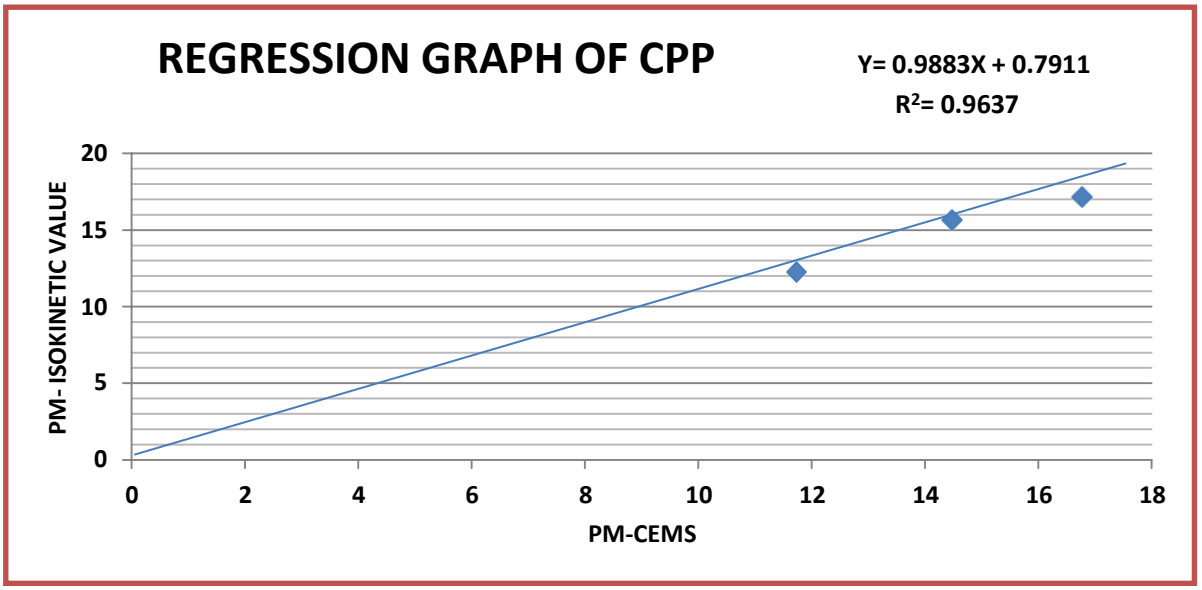
Sr. No.	Particulate Matter (mg/Nm^3)		C	M	R^2	Avg. Performance Accuracy (%)
	Iso- Kinetic Sampling Data	Online CEMS Avg. Data				
1	12.94	13.75	2.629	0.8637	0.09723	4.09
2	16.12	16.34				
3	15.46	16.25				

Observation: Installed PM CEMs at **KILN-03** is incompliance as per CPCB 1st Revised Guidelines for Continuous Emission Monitoring Systems June 2018.

Allowable deviation of Performance Accuracy of PM-CEMS during comparison study against SRM should be <±10%.

TABLE- 7
REGRESSION ANALYSIS OF CPP

Regression Analysis



Statistical Data for Regression Analysis

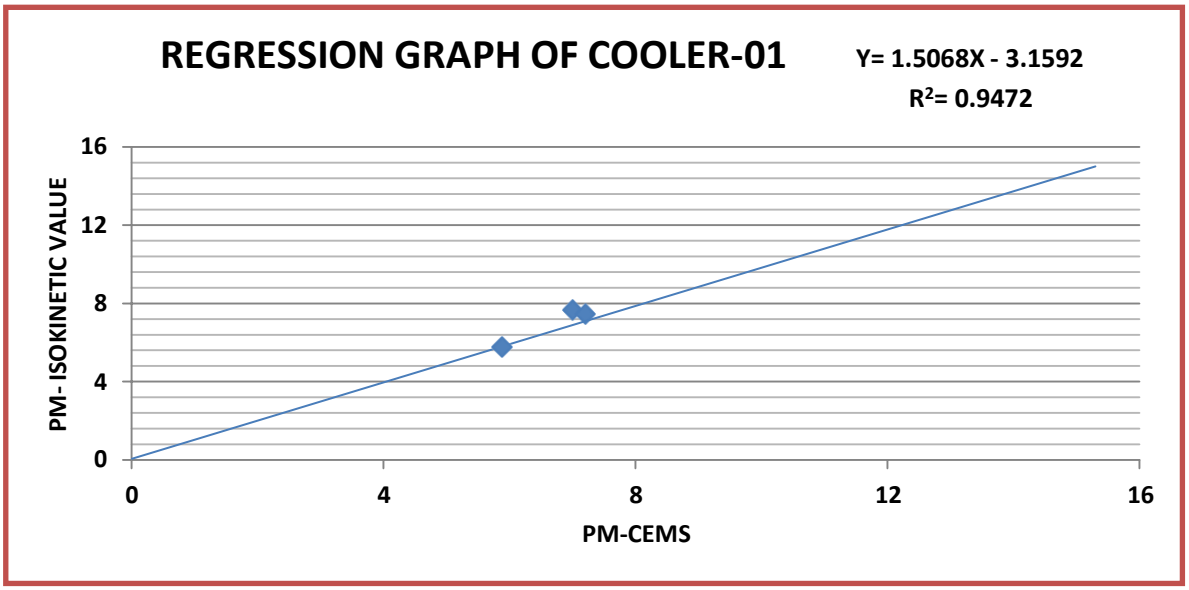
Sr. No.	Particulate Matter (mg/Nm^3)		C	M	R^2	Avg. Performance Accuracy (%)
	Iso- Kinetic Sampling Data	Online CEMS Avg. Data				
1	11.73	12.13	0.7911	0.9883	0.9637	4.35
2	14.48	15.66				
3	16.77	17.06				

Observation: Installed PM CEMs at **CPP** is incompliance as per CPCB 1st Revised Guidelines for Continuous Emission Monitoring Systems June 2018.

Allowable deviation of Performance Accuracy of PM-CEMS during comparison study against SRM should be <±10%.

TABLE- 8
REGRESSION ANALYSIS OF COOLER-01

Regression Analysis



Statistical Data for Regression Analysis

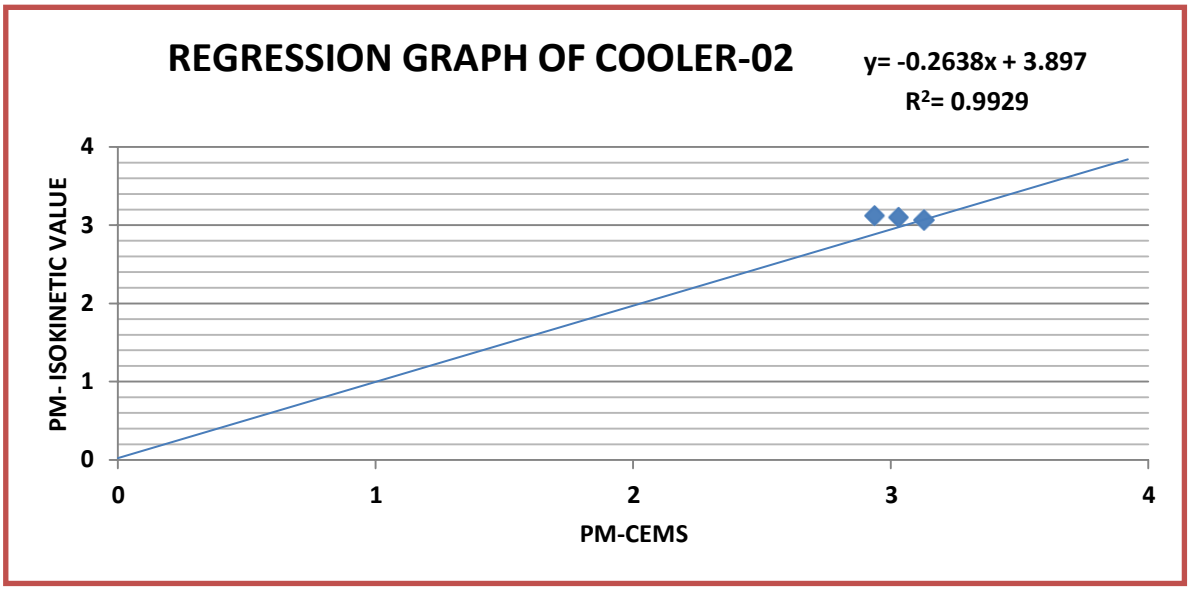
Sr. No.	Particulate Matter (mg/Nm^3)		C	M	R^2	Avg. Performance Accuracy (%)
	Iso- Kinetic Sampling Data	Online CEMS Avg. Data				
1	5.88	5.66	-3.1592	1.5068	0.9472	3.49
2	7	7.66				
3	7.2	7.46				

Observation: Installed PM CEMs at **Cooler-01** is incompliance as per CPCB 1st Revised Guidelines for Continuous Emission Monitoring Systems June 2018.

Allowable deviation of Performance Accuracy of PM-CEMS during comparison study against SRM should be <±10%.

TABLE- 9
REGRESSION ANALYSIS OF COOLER-02

Regression Analysis



Statistical Data for Regression Analysis

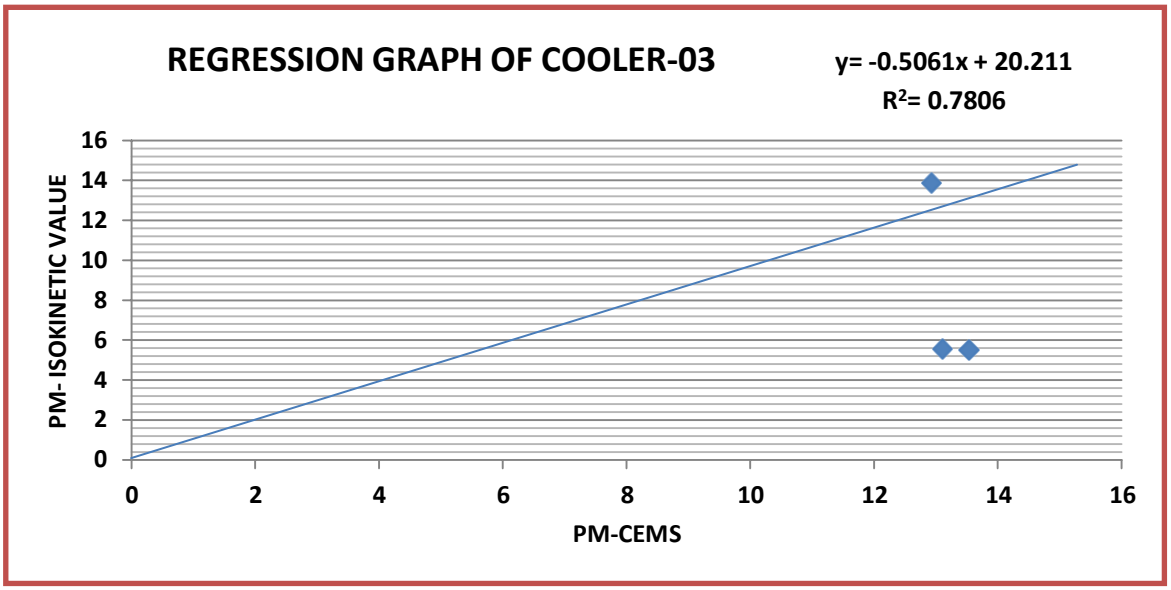
Sr. No.	Particulate Matter (mg/Nm^3)		C	M	R^2	Avg. Performance Accuracy (%)
	Iso- Kinetic Sampling Data	Online CEMS Avg. Data				
1	3.13	3.07	3.897	-0.2638	0.9929	2.09
2	3.03	3.10				
3	2.94	3.12				

Observation: Installed PM CEMs at **Cooler-02** is incompliance as per CPCB 1st Revised Guidelines for Continuous Emission Monitoring Systems June 2018.

Allowable deviation of Performance Accuracy of PM-CEMS during comparison study against SRM should be <±10%.

TABLE- 10
REGRESSION ANALYSIS OF COOLER-03

Regression Analysis



Statistical Data for Regression Analysis

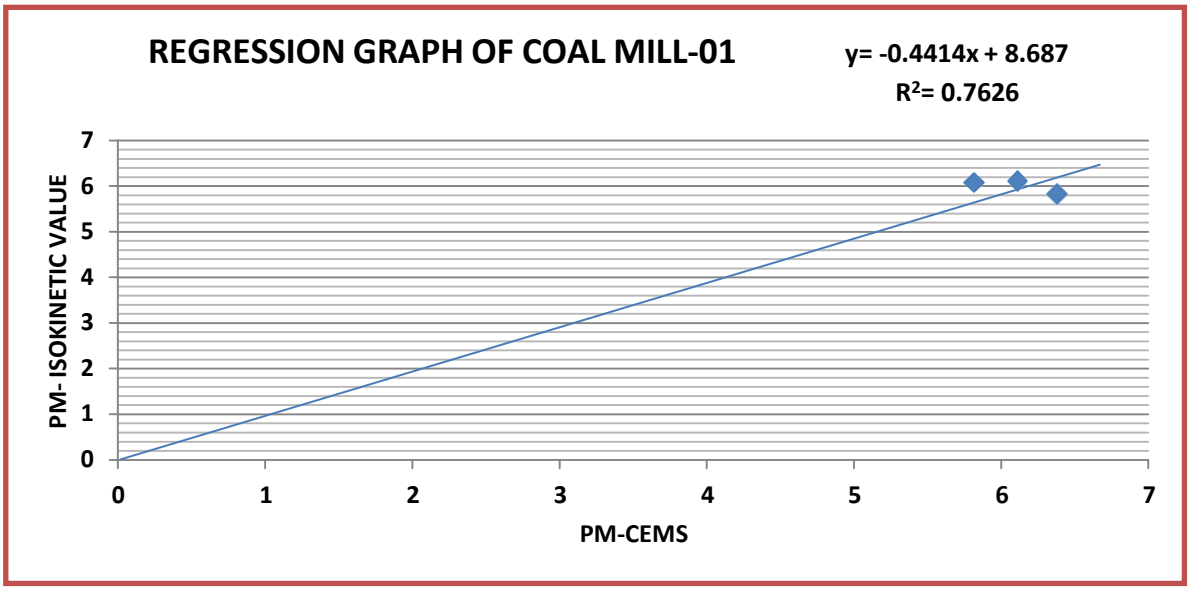
Sr. No.	Particulate Matter (mg/Nm^3)		C	M	R^2	Avg. Performance Accuracy (%)
	Iso- Kinetic Sampling Data	Online CEMS Avg. Data				
1	12.93	13.60	20.211	-0.5061	0.7806	2.58
2	13.11	13.67				
3	13.54	13.33				

Observation: Installed PM CEMs at **Cooler-03** is incompliance as per CPCB 1st Revised Guidelines for Continuous Emission Monitoring Systems June 2018.

Allowable deviation of Performance Accuracy of PM-CEMS during comparison study against SRM should be <±10%.

TABLE- 11
REGRESSION ANALYSIS OF COAL MILL-01

Regression Analysis



Statistical Data for Regression Analysis

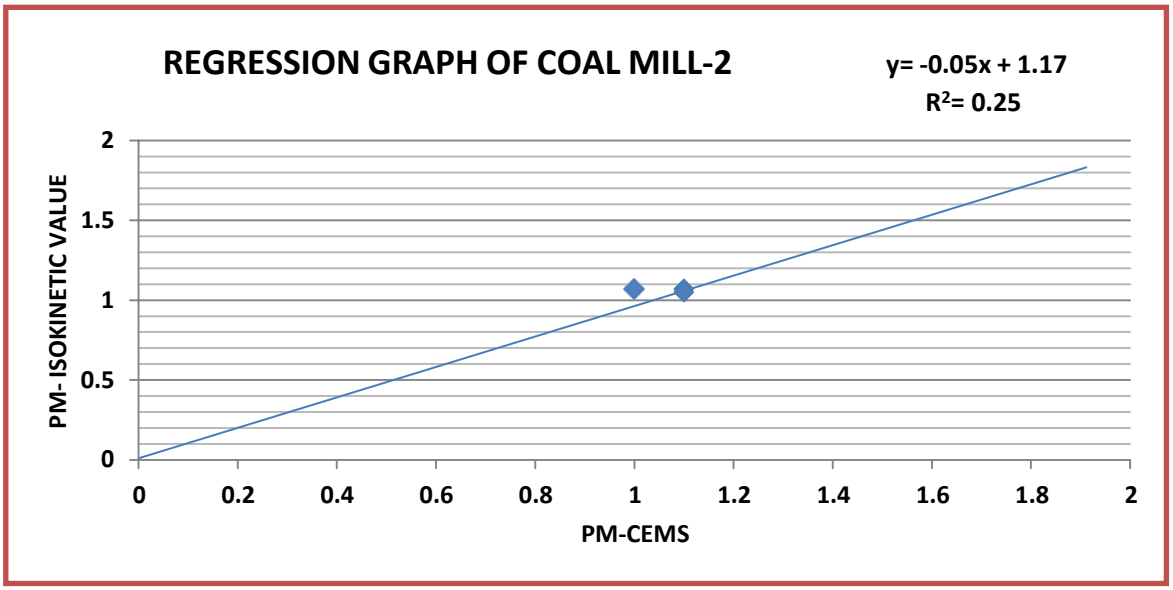
Sr. No.	Particulate Matter (mg/Nm^3)		C	M	R^2	Avg. Performance Accuracy (%)
	Iso- Kinetic Sampling Data	Online CEMS Avg. Data				
1	5.82	6.08	8.687	-0.4414	0.7626	1.84
2	6.11	6.07				
3	6.38	5.83				

Observation: Installed PM CEMs at **Coal Mill-01** is incompliance as per CPCB 1st Revised Guidelines for Continuous Emission Monitoring Systems June 2018.

Allowable deviation of Performance Accuracy of PM-CEMS during comparison study against SRM should be <±10%.

TABLE- 12
REGRESSION ANALYSIS OF COAL MILL-02

Regression Analysis



Statistical Data for Regression Analysis

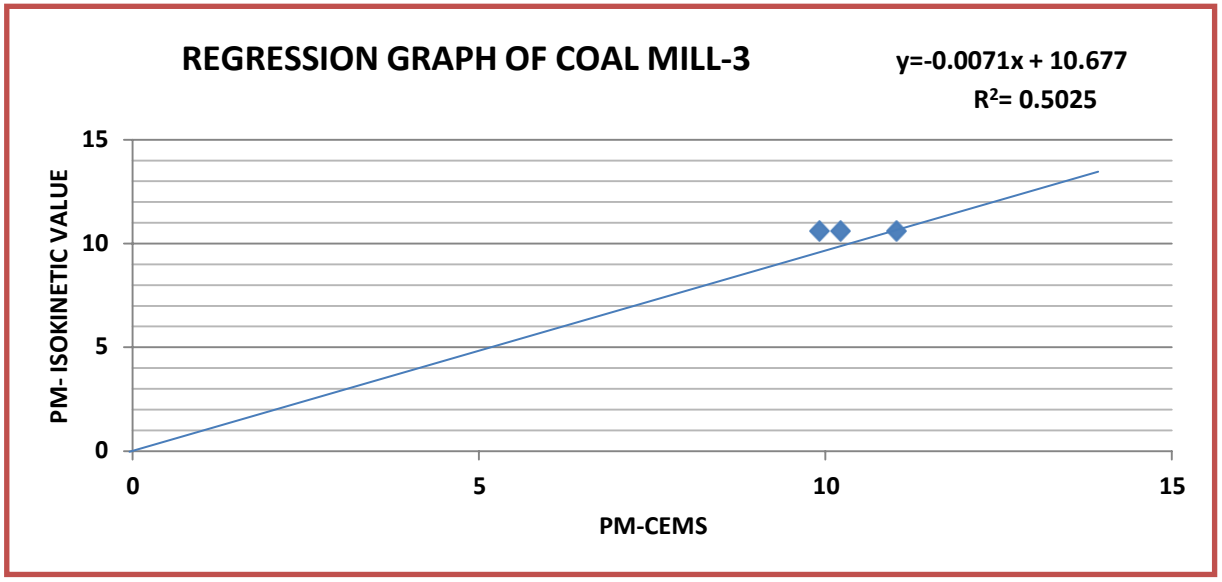
Sr. No.	Particulate Matter (mg/Nm^3)		C	M	R^2	Avg. Performance Accuracy (%)
	Iso- Kinetic Sampling Data	Online CEMS Avg. Data				
1	1.10	1.07	1.17	-0.1	0.25	0.31
2	1.00	1.07				
3	1.10	1.05				

Observation: Installed PM CEMs at **Coal Mill-02** is incompliance as per CPCB 1st Revised Guidelines for Continuous Emission Monitoring Systems June 2018.

Allowable deviation of Performance Accuracy of PM-CEMS during comparison study against SRM should be <±10%.

TABLE- 13
REGRESSION ANALYSIS OF COAL MILL-03

Regression Analysis



Statistical Data for Regression Analysis

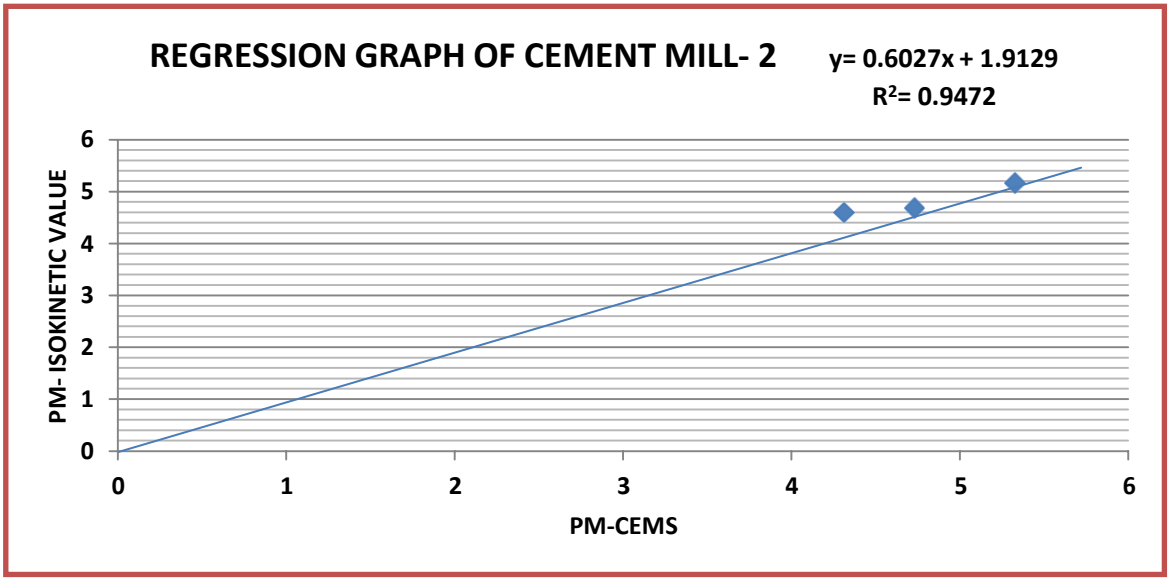
Sr. No.	Particulate Matter (mg/Nm^3)		C	M	R^2	Avg. Performance Accuracy (%)
	Iso- Kinetic Sampling Data	Online CEMS Avg. Data				
1	10.22	10.60	10.677	-0.0071	0.5025	2.05
2	9.92	10.61				
3	11.03	10.60				

Observation: Installed PM CEMs at **Coal Mill-03** is incompliance as per CPCB 1st Revised Guidelines for Continuous Emission Monitoring Systems June 2018.

Allowable deviation of Performance Accuracy of PM-CEMS during comparison study against SRM should be <±10%.

TABLE- 14
REGRESSION ANALYSIS OF CEMENT MILL-02

Regression Analysis



Statistical Data for Regression Analysis

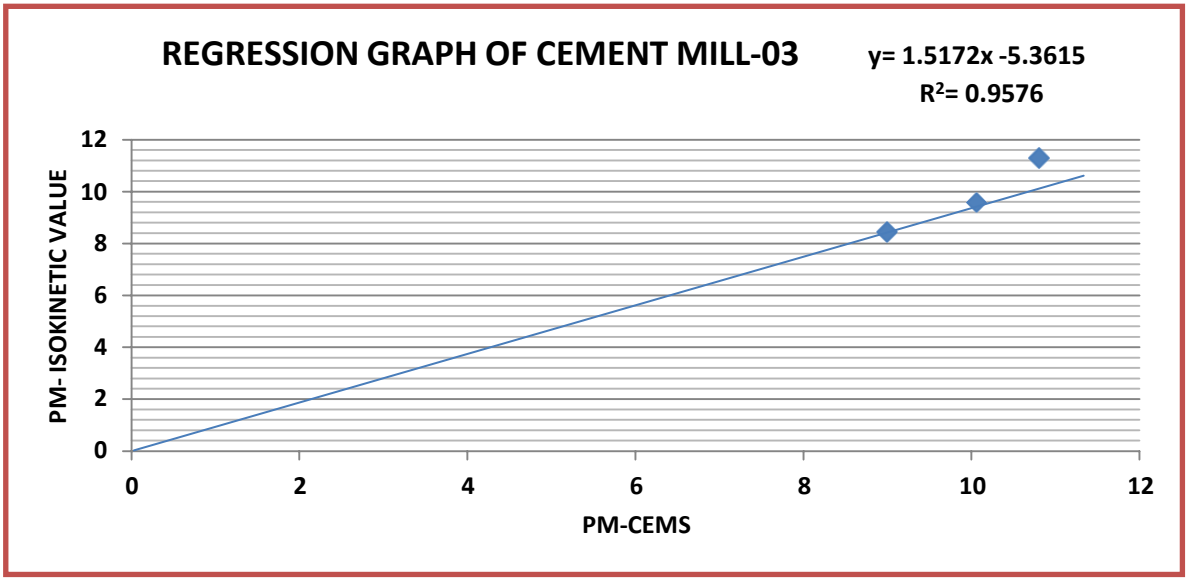
Sr. No.	Particulate Matter (mg/Nm^3)		C	M	R^2	Avg. Performance Accuracy (%)
	Iso- Kinetic Sampling Data	Online CEMS Avg. Data				
1	4.73	4.68	1.9129	0.6027	0.9472	0.21
2	4.31	4.56				
3	5.33	5.16				

Observation: Installed PM CEMs at **Cement Mill-02** is incompliance as per CPCB 1st Revised Guidelines for Continuous Emission Monitoring Systems June 2018.

Allowable deviation of Performance Accuracy of PM-CEMS during comparison study against SRM should be <±10%.

TABLE- 15
REGRESSION ANALYSIS OF CEMENT MILL-03

Regression Analysis



Statistical Data for Regression Analysis

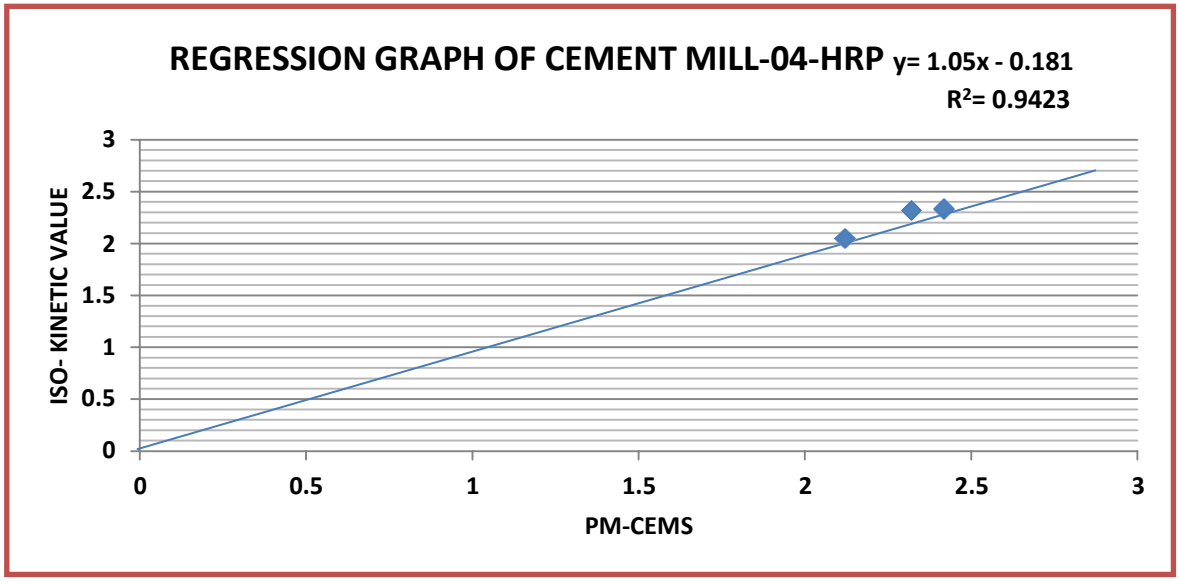
Sr. No.	Particulate Matter (mg/Nm^3)		C	M	R^2	Avg. Performance Accuracy (%)
	Iso- Kinetic Sampling Data	Online CEMS Avg. Data				
1	10.06	9.57	-5.3615	1.5172	0.9576	2.19
2	9.00	8.43				
3	10.80	11.22				

Observation: Installed PM CEMs at **Cement Mill-03** is incompliance as per CPCB 1st Revised Guidelines for Continuous Emission Monitoring Systems June 2018.

Allowable deviation of Performance Accuracy of PM-CEMS during comparison study against SRM should be <±10%.

TABLE- 16
REGRESSION ANALYSIS OF CEMENT MILL-04-HRP

Regression Analysis



Statistical Data for Regression Analysis

Sr. No.	Particulate Matter (mg/Nm^3)		C	M	R^2	Avg. Performance Accuracy (%)
	Iso- Kinetic Sampling Data	Online CEMS Avg. Data				
1	2.12	2.03	-0.181	1.05	0.9423	3.00
2	2.32	2.30				
3	2.42	2.33				

Observation: Installed PM CEMs at **Cement Mill-04_HRP** is incompliance as per CPCB 1st Revised Guidelines for Continuous Emission Monitoring Systems June 2018.

Allowable deviation of Performance Accuracy of PM-CEMS during comparison study against SRM should be <±10%.

12. Remark & Compliance

For better performance and more accuracy in PM CEMS and Gaseous CEMS receiving data and Calibration Check of PM CEMS of all stacks is recommended every after Three month as per Protocols for Online Continuous Effluent & Emission Monitoring Systems (OCEMS) 06TH March, 2018. And1st Revised Guidelines for Continuous Emission Monitoring Systems June 2018 & CEMS Audit (Recalibration) should perform at least once in a year.

KILN- 01														
Sample No.	Date	Time	Ambient Temp	Flue Gas Temp	Avg Velocity	Flow Rate (Nm^3/Sec)	SRM-PM	Avg CEM PM	Percentage Error	Absolute Percentage Error	Avg. Deviation in Comparison to SRM Value in %	C	m	R^2
1	14.06.2023	09:15 AM	30	195	21.09	69.39	9.98	10.34	-3.61	3.61	4.18	0.0008	1.0417	0.9971
2	14.06.2023	10:00 AM	30.6	194	20.99	69.20	9.53	10.00	-4.93	4.93				
3	14.06.2023	11:30 AM	30.8	195	21.11	69.46	7.76	8.07	-4.00	4.00				
KILN- 02														
Sample No.	Date	Time	Ambient Temp	Flue Gas Temp	Avg Velocity	Flow Rate (Nm^3/Sec)	SRM-PM	Avg CEM PM	Percentage Error	Absolute Percentage Error	Avg. Deviation in Comparison to SRM Value in %	C	m	R^2
1	15.06.2023	02:30 PM	33.7	121	11.98	125.10	1.69	1.68	-0.59	0.59	3.40	-0.1305	1.0476	0.9098
2	15.06.2023	03:15 PM	34	121	12.10	126.33	1.48	1.42	-4.22	4.22				
3	15.06.2023	04:00 PM	34.2	122	12.22	127.32	1.69	1.60	-5.62	5.62				
KILN- 03														
Sample No.	Date	Time	Ambient Temp	Flue Gas Temp	Avg Velocity	Flow Rate (Nm^3/Sec)	SRM-PM	Avg CEM PM	Percentage Error	Absolute Percentage Error	Avg. Deviation in Comparison to SRM Value in %	C	m	R^2
1	16.06.2023	10:45 AM	30.9	108	18.39	175.94	12.94	13.75	-6.26	6.26	4.09	2.629	0.8637	0.9723
2	16.06.2023	11:45 AM	31.1	106	18.50	177.87	16.12	16.34	-1.36	1.36				
3	16.06.2023	01:00 PM	32.2	107	18.41	176.55	15.46	16.25	-5.11	5.11				
CPP														
Sample No.	Date	Time	Ambient Temp	Flue Gas Temp	Avg Velocity	Flow Rate (Nm^3/Sec)	SRM-PM	Avg CEM PM	Percentage Error	Absolute Percentage Error	Avg. Deviation in Comparison to SRM Value in %	C	m	R^2
1	14.06.2023	04:45 PM	35.1	112	16.38	131.98	11.73	12.13	-3.41	3.41	4.35	0.7911	0.9883	0.9637
2	14.06.2023	05:30 PM	35.4	111	16.29	131.57	14.48	15.66	-8.15	8.15				
3	14.06.2023	06:15 PM	35.8	113	16.14	129.68	16.77	17.06	-1.73	1.73				

Cooler-01														
Sample No.	Date	Time	Ambient Temp	Flue Gas Temp	Avg Velocity	Flow Rate (Nm^3/Sec)	SRM-PM	Avg CEM PM	Percentage Error	Absolute Percentage Error	Avg. Deviation in Comparison to SRM Value in %	C	m	R^2
1	14.06.2023	12:45 PM	31.2	118	10.83	56.78	5.88	5.66	-3.89	3.89	3.49	-3.1592	1.5068	0.9472
2	14.06.2023	01:30 PM	31.6	120	11.01	57.45	7.00	7.66	-9.43	9.43				
3	14.06.2023	02:15 PM	32	118	10.90	57.13	7.20	7.46	-3.61	3.61				
Cooler-02														
Sample No.	Date	Time	Ambient Temp	Flue Gas Temp	Avg Velocity	Flow Rate (Nm^3/Sec)	SRM-PM	Avg CEM PM	Percentage Error	Absolute Percentage Error	Avg. Deviation in Comparison to SRM Value in %	C	m	R^2
1	15.06.2023	09:15 AM	29.8	108	5.41	36.31	3.13	3.07	-1.95	1.95	2.09	3.897	-0.2638	0.9929
2	15.06.2023	10:30 AM	30	106	5.29	35.68	3.03	3.10	-2.31	2.31				
3	15.06.2023	11:30 AM	30.4	107	5.20	34.99	2.94	3.12	-6.12	6.12				
Cooler-03														
Sample No.	Date	Time	Ambient Temp	Flue Gas Temp	Avg Velocity	Flow Rate (Nm^3/Sec)	SRM-PM	Avg CEM PM	Percentage Error	Absolute Percentage Error	Avg. Deviation in Comparison to SRM Value in %	C	m	R^2
1	16.06.2023	02:00 PM	32.6	96	3.13	23.65	12.93	13.60	-5.18	5.18	2.58	20.211	-0.5061	0.7806
2	16.06.2023	03:00 PM	32.9	95	3.21	24.35	13.11	13.67	-4.27	4.27				
3	16.06.2023	04:00 PM	33.2	97	3.11	23.45	13.54	13.33	-1.57	1.57				
Coal Mill-01														
Sample No.	Date	Time	Ambient Temp	Flue Gas Temp	Avg Velocity	Flow Rate (Nm^3/Sec)	SRM-PM	Avg CEM PM	Percentage Error	Absolute Percentage Error	Avg. Deviation in Comparison to SRM Value in %	C	m	R^2
1	14.06.2023	02:45 PM	32.4	74	25.27	9.58	5.82	6.08	-4.47	4.47	1.84	8.687	-0.4414	0.7626
2	14.06.2023	03:30 PM	32.7	72	24.25	9.25	6.11	6.07	-0.66	0.66				
3	14.06.2023	04.15 PM	33	73	24.82	9.44	6.38	5.83	-9.43	9.43				

Coal Mill-02														
Sample No.	Date	Time	Ambient Temp	Flue Gas Temp	Avg Velocity	Flow Rate (Nm^3/Sec)	SRM-PM	Avg CEM PM	Percentage Error	Absolute Percentage Error	Avg. Deviation in Comparison to SRM Value in %	C	m	R^2
1	15.06.2023	01:15 PM	30.8	68	17.25	29.49	1.10	1.07	-2.80	2.80	0.31	1.17	-0.1	0.25
2	15.06.2023	02:00 PM	31.1	69	17.18	29.30	1.00	1.07	-7.00	7.00				
3	15.06.2023	02:45 PM	31.4	68	17.23	29.47	1.10	1.05	-4.76	4.76				
Coal Mill-03														
Sample No.	Date	Time	Ambient Temp	Flue Gas Temp	Avg Velocity	Flow Rate (Nm^3/Sec)	SRM-PM	Avg CEM PM	Percentage Error	Absolute Percentage Error	Avg. Deviation in Comparison to SRM Value in %	C	m	R^2
1	16.06.2023	04:30 PM	33.5	73	6.16	20.36	10.22	10.60	-3.72	3.72	2.05	10.677	-0.0071	0.5025
2	16.06.2023	05:15 PM	33.8	75	6.24	20.48	9.92	10.61	-6.96	6.96				
3	16.06.2023	06:00 PM	34.1	74	6.12	20.16	11.03	10.60	-4.06	4.06				
Cement Mill-02														
Sample No.	Date	Time	Ambient Temp	Flue Gas Temp	Avg Velocity	Flow Rate (Nm^3/Sec)	SRM-PM	Avg CEM PM	Percentage Error	Absolute Percentage Error	Avg. Deviation in Comparison to SRM Value in %	C	m	R^2
1	15.06.2023	04:30 PM	34.4	84	11.55	8.91	4.73	4.68	-1.07	1.07	0.21	1.9129	0.6027	0.9472
2	15.06.2023	05:15 PM	34.8	82	11.65	9.05	4.31	4.56	-5.80	5.80				
3	15.06.2023	06:00 PM	35	85	11.73	9.03	5.33	5.16	-3.29	3.29				
Cement Mill-03														
Sample No.	Date	Time	Ambient Temp	Flue Gas Temp	Avg Velocity	Flow Rate (Nm^3/Sec)	SRM-PM	Avg CEM PM	Percentage Error	Absolute Percentage Error	Avg. Deviation in Comparison to SRM Value in %	C	m	R^2
1	16.06.2023	08:45 AM	28.4	84	6.42	34.46	10.06	9.57	-5.12	5.12	2.19	-5.3615	1.5172	0.9576
2	16.06.2023	08:45 AM	29.8	82	6.51	35.11	9.00	8.43	-6.76	6.76				
3	16.06.2023	09:00 AM	30.3	83	6.58	35.46	10.08	11.22	-11.31	11.31				

Cement Mill-04-HRP														
Sample No.	Date	Time	Ambient Temp	Flue Gas Temp	Avg Velocity	Flow Rate (Nm^3/Sec)	SRM-PM	Avg CEM PM	Percentage Error	Absolute Percentage Error	Avg. Deviation in Comparison to SRM Value in %	C	m	R^2
1	16.06.2023	06:15 PM	34.3	93	5.65	27.55	2.12	2.03	-4.31	4.31	3.00	-0.181	1.05	0.9423
2	16.06.2023	07:00 PM	34.7	91	5.57	27.32	2.32	2.30	-0.87	0.87				
3	16.06.2023	07:45 PM	34.4	92	5.68	27.76	2.42	2.33	-3.86	3.86				

13. Comparison of Gaseous CEMS Data

Soon, CPCB plans to regulate source emissions from stationary sources through implementation of an emission trading scheme (ETS). In this context, industries are instructed to install online Continuous Emission Monitoring Systems (CEMS with Data Acquisition System (DAS)) for gaseous pollutants and data generated in DAS will be linked with CPCB Data Acquisition and Handling centre (DAHC). JK Cement Limited proactively initiated the installation of CEMS for gaseous pollutants along with particulate matter (PM).

Various technologies are available for monitoring of Particulate Matter (PM) and gaseous emission from the stack of industries and in terms of the parameters specified in the directions issued by CPCB. The selection and suitability of CEMS specific to the pollutant type and industry wise are recommended in the latest CPCB Guidelines for Continuous Emission Monitoring Systems. The Gaseous and PM CEMS are installed at 3 Kiln stacks (KILN- 1, 2 & 3) to measure the Gaseous Parameters at JK Cement Limited, Mangrol to continuously measure pollutant levels as per above CPCB guidelines.

To know the Concentrations of SO2 and NOx in Kiln stacks, Portable Combustion Flue Gas Analyser Make of Kane 900 plus is used as Standard Reference Method (SRM). Details of findings are presented below **Tables 17 to Table 19.**

TABLE- 17

CEMS DATA (GASEOUS) VERSUS KANE 900 PLUS GAS ANAYSER RESULTS FOR KILN-01

Date of Monitoring	NOx (mg/m3)			SOx (mg/m3)		
	CEMs Data	Kane 900 plus DATA	Performance Deviation (%)	CEMs Data	Kane 900 plus DATA	Performance Deviation (%)
14.06.2023	170.14	174.29	2.44	2.43	2.41	0.83
14.06.2023	181.96	183.00	0.57	1.59	1.68	5.66
14.06.2023	173.38	166.90	3.88	7.54	7.13	5.75

*All SRM values are corrected to 10% O_2

*BDL- below Detectable Limit

TABLE- 18

CEMS DATA (GASEOUS) VERSUS KANE 900 PLUS GAS ANAYSER RESULTS FOR KILN-02

Date of Monitoring	NOx (mg/m3)			SOx (mg/m3)		
	CEMs Data	Kane 900 plus DATA	Performance Deviation (%)	CEMs Data	Kane 900 plus DATA	Performance Deviation (%)
15.06.2023	490.02	471.48	3.92	9.54	9.76	2.31
15.06.2023	464.26	451.19	2.89	9.85	10.30	4.57
15.06.2023	445.91	437.44	1.94	9.26	9.11	1.65

*All SRM values are corrected to 10% O_2

TABLE- 19

CEMS DATA (GASEOUS) VERSUS KANE 900 PLUS GAS ANAYSER RESULTS FOR KILN-03

Date of Monitoring	NOx (mg/m3)			SOx (mg/m3)		
	CEMs Data	Kane 900 plus DATA	Performance Deviation (%)	CEMs Data	Kane 900 plus DATA	Performance Deviation (%)
16.06.2023	223.55	216.89	3.07	13.07	13.72	4.97
16.06.2023	273.75	261.04	4.87	13.92	14.32	2.87
16.06.2023	285.95	274.41	4.20	14.57	15.42	5.83

*All SRM values are corrected to 10% O_2

14. Conclusion

PM- CEMS

Since Performance deviation (%) for all CEMS data available stacks is less than 10%, hence PM-CEMS data appears valid. This also concludes that Regression Slope i.e. correction factor (m) can maintain till next calibration.

Gaseous-CEMS

Since Performance deviation (%) for given all KILN Stacks is less than 10%, hence Gaseous-CEMS data appears valid. This is also concludes that regression Slope i.e. Correction factor (m) can maintain till next calibration.

15. Reference

- CPCB/e-Publication/2013-14(Specifications and guidelines for Continuous Emissions Monitoring Systems) for PM Measurement with special referenceto Emission Trading Programs: Dated 22nd November 2013
- 1st Revised Guidelines for Continuous Emission Monitoring Systems; June,2018.
- IS: 11255 (Part- 1, 2 & 7)

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ISSUED TO:

M/S. J.K. CEMENT LIMITED
Unit: - J.K. CEMENT WORKS MANGROL
C/o. KAILASH NAGAR, NIMBAHERA,
DIST: CHITTORGARH, RAJASTHAN-312617,
INDIA.

Report Number	:	**VLL/VLS/23/10179/021**
Issued Date	:	**2023/09/26**
P.O. Number	:	**4600094827**
P.O. Date	:	**31/09/2023**

SAMPLE PARTICULARS : **Stack Connected to Bag House Kiln-II**

Sample Registration Date	:	2023/09/11	Sample Collection Date	:	2023/09/09
Analysis Starting Date	:	2023/09/11	Analysis Completion Date	:	2023/09/26
Test Required	:	O_2, PM, SO_2, NOx, HCl, HF, CO, CO_2 and TOC.			
Sample Collected by Vimta Labs Ltd.					

TEST REPORT

Sr.No.	Parameters	UoM	Method of Testing	Results	Limits as per MoE,F & CC Notification GSR 497(E)
1	Diameter of stack	m	-	4.25	--
2	Flue gas temperature	^0C	-	118	--
3	Fuel	-	Coal+ pet coke+ co-processing of waste	--	--
4	Oxygen as O_2	%	Flue Gas Analyzer	6.21	--
5	Velocity	m/sec	USEPA Method- 3	11.0	--
6	Volumetric flow rate	Nm^3/Sec		103.98	--
7	Carbon Monoxide as CO	mg/Nm^3	Combustion Flue Gas Analyzer	89	**<100.0**
8	Carbon Dioxide as CO_2	%		24.33	--
9	Sulphur Dioxide	mg/Nm^3		26	**<100.0**
10	Oxides of Nitrogen, NOx as NO_2	mg/Nm^3		595	**<800.0**
11	Particulate Matter	mg/Nm^3	USEPA method-5	7.3	**<30.0**
12	Hydrogen Chloride as HCl	mg/Nm^3	USEPA method -26	5.6	**<10.0**
13	Hydrogen Fluoride as HF	mg/Nm^3	USEPA method -13	0.67	**<1.0**
14	Total Organic Compounds as TOC	mg/nm^3	USEPA method -40 & MM5(10)	7.2	**<10.0**

All the Values are represented at 10% O_2

VIMTA LABS LTD HYDERABAD

Dr. SubbaReddy Mallampati
Dy.Manager-Environment.

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SAMPLE PARTICULARS : **Stack Connected to Bag House Kiln-II**

Sample Registration Date	:	2023/09/11	Sample Collection Date	:	2023/09/09
Analysis Starting Date	:	2023/09/11	Analysis Completion Date	:	2023/09/26
Test Required	:	Hg & its compounds, Cd + Tl its compounds, Sb+ As+ Pb+ Co+ Cr+ Cu+ Mn+ Ni+ V+ Their compounds			

Sample Collected by Vimta Labs Ltd.

TEST REPORT

Sr. No.	Parameters	UoM	Method of Testing	Results	Limits as per MoE,F&CC Notification GSR 497(E)
1	Mercury as Hg + their Compound	mg/Nm^3	USEPA method -29	<0.001	**<0.05**
2	Cadmium + Thallium (Cd + Tl) + their Compound			<0.001	**<0.05**
3	Chromium as Cr + their Compound			0.021	--
	Manganese as Mn + their Compound			0.019	
	Arsenic as As + their Compound			0.007	
	Antimony as Sb + their Compound			0.025	
	Lead as Pb + their Compound			0.022	
	Cobalt as Co + their Compound			0.017	
	Copper as Cu + their Compound			0.020	
	Nickel as Ni + their Compound			0.016	
	Vanadium as V + their Compound			0.023	
	Sb+ As+ Pb+ Co+ Cr+ Cu+ Mn+ Ni+ V+ Their compounds			**0.139**	**<0.5**

Instruments used: GC-FID, ICP-MS, Cold Vapor AAS and GC-MS
All the values are represented at 10% O_2

VIMTA LABS LTD HYDERABAD

Dr. SubbaReddy Mallampati
Dy.Manager-Environment.

Vimta Labs Limited
Registered Office
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Vimta
Driven by Quality. Inspired by Science.

ISSUED TO:
M/S. J.K. CEMENT LIMITED
Unit: - J.K. CEMENT WORKS MANGROL
C/o. KAILASH NAGAR, NIMBAHERA,
DIST: CHITTORGARH, RAJASTHAN-312617,
INDIA.

Report Number	:	**VLL/VLS/23/10179/022**
Issued Date	:	**2023/09/26**
P.O. Number	:	**4600094827**
P.O. Date	:	**31/09/2023**

SAMPLE PARTICULARS : **Stack Connected to Bag House Kiln-II**

Sample Registration Date	:	2023/09/11	Sample Collection Date	:	2023/09/09
Analysis Starting Date	:	2023/09/11	Analysis Completion Date	:	2023/09/26
Test Required	:	PCDD & PCDF			

Sample Collected by Vimta Labs Ltd.

TEST REPORT

Sr.No.	Parameters	UoM	Results
1	2,3,7,8-TCDF	ng/Nm^3, TEQ	0.0012
2	1,2,3,7,8-PeCDF		0.0009
3	2,3,4,7,8-PeCDF		0.0050
4	1,2,3,4,7,8-HxCDF		0.0018
5	1,2,3,6,7,8-HxCDF		0.0001
6	2,3,4,6,7,8-HxCDF		0.0003
7	1,2,3,7,8,9-HxCDF		0.0003
8	1,2,3,4,6,7,8-HpCDF		0.0022
9	1,2,3,4,7,8,9-HpCDF		0.0003
10	OCDF		0.0004
11	2,3,7,8-TCDD		0.0004
12	1,2,3,7,8-PeCDD		0.0005
13	1,2,3,4,7,8-HxCDD		0.0021
14	1,2,3,6,7,8-HxCDD		0.0012
15	1,2,3,7,8,9-HxCDD		0.0002
16	1,2,3,4,6,7,8-HpCDD		0.00002
17	OCDD		0.00002
Total Furans & Dioxins		**ng/Nm^3, TEQ**	**0.0168**
Total Furans & Dioxins		**ng/Nm^3, TEQ Corrected to 10% O_2 Concentration**	**0.0125**
Limits as per MoE,F & CC Notification GSR 497(E)			**<0.1**

Method of Testing: As per USEPA 23 A & 8290
Instruments used: Auto spec Premier (HRGC/HRMS). Detection Limit: 0.01pg

Dr. SubbaReddy Mallampati
Dy.Manager-Environment.

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INDIA.

Report Number	:	**VLL/VLS/23/10179/023**
Issued Date	:	**2023/09/26**
P.O. Number	:	**4600094827**
P.O. Date	:	**31/09/2023**

SAMPLE PARTICULARS : **Stack Connected to Bag House Kiln-III**

Sample Registration Date	:	2023/09/11	Sample Collection Date	:	2023/09/07
Analysis Starting Date	:	2023/09/11	Analysis Completion Date	:	2023/09/26
Test Required	:	O_2, PM, SO_2, NOx, HCl, HF, CO, CO_2 and TOC.			
Sample Collected by Vimta Labs Ltd.					

TEST REPORT

Sr.No.	Parameters	UoM	Method of Testing	Results	Limits as per MoE,F & CC Notification GSR 497(E)
1	Diameter of stack	m	-	4.0	--
2	Flue gas temperature	^0C	-	114	--
3	Fuel	-	Coal+ pet coke+ co-processing of waste	--	--
4	Oxygen as O_2	%	Flue Gas Analyzer	6.62	--
5	Velocity	m/sec	USEPA Method- 3	16.1	--
6	Volumetric flow rate	Nm^3/Sec		135.4	--
7	Carbon Monoxide as CO	mg/Nm^3	Combustion Flue Gas Analyzer	30	**<100.0**
8	Carbon Dioxide as CO_2	%		24.04	--
9	Sulphur Dioxide	mg/Nm^3		55	**<100.0**
10	Oxides of Nitrogen, NOx as NO_2	mg/Nm^3		435	**<600.0**
11	Particulate Matter	mg/Nm^3	USEPA method-5	5.1	**<30.0**
12	Hydrogen Chloride as HCl	mg/Nm^3	USEPA method -26	5.9	**<10.0**
13	Hydrogen Fluoride as HF	mg/Nm^3	USEPA method -13	0.62	**<1.0**
14	Total Organic Compounds as TOC	mg/nm^3	USEPA method -40 & MM5(10)	6.9	**<10.0**

All the Values are represented at 10% O_2

VIMTA LABS LTD HYDERABAD

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Report Number	:	**VLL/VLS/23/10179/023**
Issued Date	:	**2023/09/26**
P.O. Number	:	**4600094827**
P.O. Date	:	**31/09/2023**

SAMPLE PARTICULARS : **Stack Connected to Bag House Kiln-III**

Sample Registration Date	:	2023/09/11	Sample Collection Date	:	2023/09/07
Analysis Starting Date	:	2023/09/11	Analysis Completion Date	:	2023/09/26
Test Required	:	Hg & its compounds, Cd + Tl its compounds, Sb+ As+ Pb+ Co+ Cr+ Cu+ Mn+ Ni+ V+ Their compounds			

Sample Collected by Vimta Labs Ltd.

TEST REPORT

Sr. No.	Parameters	UoM	Method of Testing	Results	Limits as per MoE,F&CC Notification GSR 497(E)
1	Mercury as Hg + their Compound	mg/Nm^3	USEPA method -29	<0.001	**<0.05**
2	Cadmium + Thallium (Cd + Tl) + their Compound			<0.001	**<0.05**
3	Chromium as Cr + their Compound			0.026	--
	Manganese as Mn + their Compound			0.028	
	Arsenic as As + their Compound			0.016	
	Antimony as Sb + their Compound			0.031	
	Lead as Pb + their Compound			0.019	
	Cobalt as Co + their Compound			0.021	
	Copper as Cu + their Compound			0.025	
	Nickel as Ni + their Compound			0.019	
	Vanadium as V + their Compound			0.022	
	Sb+ As+ Pb+ Co+ Cr+ Cu+ Mn+ Ni+ V+ Their compounds			**0.167**	**<0.5**

Instruments used: GC-FID, ICP-MS, Cold Vapor AAS and GC-MS
All the values are represented at 10% O_2

VIMTA LABS LTD.

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Unit: - J.K. CEMENT WORKS MANGROL
C/o. KAILASH NAGAR, NIMBAHERA,
DIST: CHITTORGARH, RAJASTHAN-312617,
INDIA.

Report Number	:	**VLL/VLS/23/10179/024**
Issued Date	:	**2023/09/26**
P.O. Number	:	**4600094827**
P.O. Date	:	**31/09/2023**

SAMPLE PARTICULARS : **Stack Connected to Bag House Kiln-III**

Sample Registration Date	:	2023/09/11	Sample Collection Date	:	2023/09/07
Analysis Starting Date	:	2023/09/11	Analysis Completion Date	:	2023/09/26
Test Required	:	PCDD & PCDF			

Sample Collected by Vimta Labs Ltd.

TEST REPORT

Sr.No.	Parameters	UoM	Results
1	2,3,7,8-TCDF	ng/Nm³, TEQ	0.0012
2	1,2,3,7,8-PeCDF		0.0009
3	2,3,4,7,8-PeCDF		0.0048
4	1,2,3,4,7,8-HxCDF		0.0018
5	1,2,3,6,7,8-HxCDF		0.0001
6	2,3,4,6,7,8-HxCDF		0.0006
7	1,2,3,7,8,9-HxCDF		0.0004
8	1,2,3,4,6,7,8-HpCDF		0.0025
9	1,2,3,4,7,8,9-HpCDF		0.0003
10	OCDF		0.0004
11	2,3,7,8-TCDD		0.0004
12	1,2,3,7,8-PeCDD		0.0006
13	1,2,3,4,7,8-HxCDD		0.0022
14	1,2,3,6,7,8-HxCDD		0.0014
15	1,2,3,7,8,9-HxCDD		0.0001
16	1,2,3,4,6,7,8-HpCDD		0.00001
17	OCDD		0.00002
Total Furans & Dioxins		**ng/Nm³, TEQ**	0.0178
Total Furans & Dioxins		**ng/Nm³, TEQ Corrected to 10% O_2 Concentration**	0.0136
Limits as per MoE,F & CC Notification GSR 497(E)			< 0.1

Method of Testing: As per USEPA 23 A & 8290
Instruments used: Auto spec Premier (HRGC/HRMS). Detection Limit: 0.01pg

VIMTA LABS LTD HYDERABAD

Dr. SubbaReddy Mallampati
Dy.Manager-Environment.

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www.wolkem.com

Report No. 20230531258/A

Report Issue Date: - 15.06.2023

TEST REPORT

1. **Name of Customer**	:	M/s J.K. Cement Works Mangrol, (Unit-Cement Plant), Tehsil - Nimbahera, District – Chittorgarh, State- Rajasthan (INDIA),
2. **Purchase Order Number**	:	4600093211 Dated:- 13.06.2023
3. **Date & Time of Monitoring**	:	26.05.2023/08:25AM
4 **Sample Identification**	:	Air Sample
5. **Condition of Sample**	:	Sealed/Ok
6. **Sample Received On**	:	31.05.2023
7. **Period of Analysis**	:	31.05.2023 to 14.06.2023
8. **Name of Location**	:	Near Time Office
9. **Method of Sampling**	:	IS: 5182(Part 2,6,9,22,23) & Instrument Manual

S. No	Monitoring Details	Unit	Results
1.	Duration of Survey	Minutes	1442.2
2.	Average Flow rate for PM_{10}	M^3/ Min	1.2
3.	Ambient Temperature	°C	30.8
4.	Relative Humidity	%	42

Results Ambient Air Quality

S. No	Parameters	Test Method	Unit	Results	NAAQS (CPCB Norms) New Delhi dt. 18th Nov. 2009
Chemical Testing - Atmospheric Pollution - Ambient Air					
1.	PM_{10}	IS:5182 (Part-23)	$\mu g/m^3$	73.08	100
2.	$PM_{2.5}$	WIL/SOP No. 10/25 Issue date 01.05.2019	$\mu g/m^3$	28.40	60
3.	SO_2	IS:5182 (Part-2)	$\mu g/m^3$	BDL(<6)	80
4.	NO_2	IS:5182 (Part-6)	$\mu g/m^3$	13.50	80
5.	Ozone as O_3	IS:5182 (Part-9)	$\mu g/m^3$	BDL(<20)	100
6.	NH_3	CPCB manual & 401-Method Air sampling & analysis, 3rd Edition	$\mu g/m^3$	22.98	400
7.	Lead	IS:5182 (Part-22)	$\mu g/m^3$	BDL(<0.05)	1 (24 hour average)
8.	Nickel	CPCB Guidelines 1988	ng/m^3	BDL(<4)	20 (Annual average)

BDL- Below Detection Limit

Tested By

(Leena Sharma)
Chemist

Authorized Signatory

(Amreesh Kumar)
Lab Incharge

Environmental & Chemical Laboratory
Wolkem India Limited
E-102, M.I.A., UDAIPUR (Rajasthan)

Note

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4. The samples will be destroyed after 15 days from the date of issue of test certificate unless otherwise specified.
5. Any discrepancy in test results should be reported within 15 days.

End of Report

Registered & Corporate Office :
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Phone : +91 294 2494600 - 02 E-mail : info@wolkem.com
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TC-5941

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Phone : 91 294 2494600 to 02 E-mail : info.wcs@wolkem.com
www.wolkem.com

Report No. 20230531258/B

Report Issue Date: - 15.06.2023

TEST REPORT

1. **Name of Customer**	:	M/s J.K. Cement Works Mangrol, (Unit-Cement Plant), Tehsil - Nimbahera, District – Chittorgarh, State- Rajasthan (INDIA),
2. **Purchase Order Number**	:	4600093211 Dated:- 13.06.2023
3. **Date & Time of Monitoring**	:	26.05.2023/08:25AM
4 **Sample Identification**	:	Air Sample
5. **Condition of Sample**	:	Sealed/Ok
6. **Sample Received On**	:	31.05.2023
7. **Period of Analysis**	:	31.05.2023 to 14.06.2023
8. **Name of Location**	:	Near Time Office
9. **Method of Sampling**	:	IS: 5182(Part 11, 12) & Instrument Manual

S. No	Monitoring Details	Unit	Results
1.	Ambient Temperature	°C	30.8
2.	Relative Humidity	%	42

Results Ambient Air Quality

S. No	Parameters	Test Method	Unit	Results	NAAQS (CPCB Norms) New Delhi dt. 18th Nov. 2009
Chemical Testing - Atmospheric Pollution - Ambient Air					
1.	CO	BY CO Meter	mg/m^3	0.31	04 (1 hour)
2.	Benzo(a)pyrene	IS:5182 (Part-12) NAAQS Guideline	ng/m^3	BDL(<0.01)	1 (Annual average)
3.	Arsenic	CPCB Guideline 2011	ng/m^3	BDL(<3)	6 (Annual average)
4	Benzene	IS:5182 (Part-11) NAAQS Guideline	$\mu g/m^3$	BDL(<0.01)	5 (Annual average)

BDL- Below Detection Limit

Tested By

(Leena Sharma)
Chemist

Authorized Signatory

(Amreesh Kumar)
Lab Incharge

Environmental & Chemical Laboratory
Wolkem India Limited
E-102, M.I.A., UDAIPUR (Rajasthan)

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End of Report

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www.wolkem.com

Report No. 20230531259/A

Report Issue Date: - 15.06.2023

TEST REPORT

1. **Name of Customer**	:	M/s J.K. Cement Works Mangrol, (Unit-Cement Plant), Tehsil - Nimbahera, District – Chittorgarh, State- Rajasthan (INDIA).
2. **Purchase Order Number**	:	4600093211 Dated:- 13.06.2023
3. **Date & Time of Monitoring**	:	26.05.2023/09:30AM
4 **Sample Identification**	:	Air Sample
5. **Condition of Sample**	:	Sealed/Ok
6. **Sample Received On**	:	31.05.2023
7. **Period of Analysis**	:	31.05.2023 to 14.06.2023
8. **Name of Location**	:	Near Thermal Power Plant
9. **Method of Sampling**	:	IS: 5182(Part 2,6,9,22,23) & Instrument Manual

S. No	Monitoring Details	Unit	Results
1.	Duration of Survey	Minutes	1445.6
2.	Average Flow rate for PM_{10}	M^3/ Min	1.15
3.	Ambient Temperature	°C	31.2
4.	Relative Humidity	%	45

Results Ambient Air Quality

S. No	Parameters	Test Method	Unit	Results	NAAQS (CPCB Norms) New Delhi dt. 18th Nov. 2009
Chemical Testing - Atmospheric Pollution - Ambient Air					
1.	PM_{10}	IS:5182 (Part-23)	$\mu g/m^3$	68.89	100
2.	$PM_{2.5}$	WIL/SOP No. 10/25 Issue date 01.05.2019	$\mu g/m^3$	27.50	60
3.	SO_2	IS:5182 (Part-2)	$\mu g/m^3$	BDL(<6)	80
4.	NO_2	IS:5182 (Part-6)	$\mu g/m^3$	13.31	80
5.	Ozone as O_3	IS:5182 (Part-9)	$\mu g/m^3$	BDL(<20)	100
6.	NH_3	CPCB manual & 401-Method Air sampling & analysis, 3rd Edition	$\mu g/m^3$	24.63	400
7.	Lead	IS:5182 (Part-22)	$\mu g/m^3$	BDL(<0.05)	1 (24 hour average)
8.	Nickel	CPCB Guidelines 1988	ng/m^3	BDL(<4)	20 (Annual average)

BDL- Below Detection Limit

Tested By

(Leera Sharma)
Chemist

Authorized Signatory

(Amreesh Kumar)
Lab Incharge
Environmental & Chemical Laboratory
Wolkem India Limited
E-102, M.I.A., UDAIPUR (Rajasthan)

Note

1. **Complaint Register is available in lab / Email ID** lab.office@wolkem.com
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End of Report

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www.wolkem.com

Report No. 20230531259/B

Report Issue Date: - 15.06.2023

TEST REPORT

1.	**Name of Customer**	:	M/s J.K. Cement Works Mangrol, (Unit-Cement Plant), Tehsil - Nimbahera, District – Chittorgarh, State- Rajasthan (INDIA),
2.	**Purchase Order Number**	:	4600093211 Dated:- 13.06.2023
3.	**Date & Time of Monitoring**	:	26.05.2023/09:30AM
4	**Sample Identification**	:	Air Sample
5.	**Condition of Sample**	:	Sealed/Ok
6.	**Sample Received On**	:	31.05.2023
7.	**Period of Analysis**	:	31.05.2023 to 14.06.2023
8.	**Name of Location**	:	Near Thermal Power Plant
9.	**Method of Sampling**	:	IS: 5182(Part 11, 12) & Instrument Manual

S. No	Monitoring Details	Unit	Results
1.	Ambient Temperature	°C	31.2
2.	Relative Humidity	%	45

Results Ambient Air Quality

S. No	Parameters	Test Method	Unit	Results	NAAQS (CPCB Norms) New Delhi dt. 18th Nov. 2009
Chemical Testing - Atmospheric Pollution - Ambient Air					
1.	CO	BY CO Meter	mg/m^3	0.33	04 (1 hour)
2.	Benzo(a)pyrene	IS:5182 (Part-12) NAAQS Guideline	ng/m^3	BDL(<0.01)	1 (Annual average)
3.	Arsenic	CPCB Guideline 2011	ng/m^3	BDL(<3)	6 (Annual average)
4.	Benzene	IS:5182 (Part-11) NAAQS Guideline	$\mu g/m^3$	BDL(<0.01)	5 (Annual average)

BDL- Below Detection Limit

Tested By

(Leena Sharma)
Chemist

Authorized Signatory

(Amreesh Kumar)
Lab Incharge
Environmental & Chemical Laboratory
Wolkem India Limited
E-102, M.I.A., UDAIPUR (Rajasthan)

Note

1. **Complaint Register is available in lab / Email ID** lab.office@wolkem.com
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4. The samples will be destroyed after 15 days from the date of issue of test certificate unless otherwise specified.
5. Any discrepancy in test results should be reported within 15 days.

__End of Report__

Registered & Corporate Office :
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Report No. 20230531260/A

Report Issue Date: - 15.06.2023

TEST REPORT

1. **Name of Customer** : M/s J.K. Cement Works Mangrol, (Unit-Cement Plant), Tehsil - Nimbahera, District – Chittorgarh, State- Rajasthan (INDIA),
2. **Purchase Order Number** : 4600093211 Dated:- 13.06.2023
3. **Date & Time of Monitoring** : 26.05.2023/11:05AM
4. **Sample Identification** : Air Sample
5. **Condition of Sample** : Sealed/Ok
6. **Sample Received On** : 31.05.2023
7. **Period of Analysis** : 31.05.2023 to 14.06.2023
8. **Name of Location** : Near Factory Gate
9. **Method of Sampling** : IS: 5182(Part 2,6,9,22,23) & Instrument Manual

S. No	Monitoring Details	Unit	Results
1.	Duration of Survey	Minutes	1441.5
2.	Average Flow rate for PM_{10}	M^3/ Min	1.17
3.	Ambient Temperature	°C	31.9
4.	Relative Humidity	%	48

Results Ambient Air Quality

S. No	Parameters	Test Method	Unit	Results	NAAQS (CPCB Norms) New Delhi dt. 18th Nov. 2009
Chemical Testing - Atmospheric Pollution - Ambient Air					
1.	PM_{10}	IS:5182 (Part-23)	$\mu g/m^3$	76.34	100
2.	$PM_{2.5}$	WIL/SOP No. 10/25 Issue date 01.05.2019	$\mu g/m^3$	32.18	60
3.	SO_2	IS:5182 (Part-2)	$\mu g/m^3$	BDL(<6)	80
4.	NO_2	IS:5182 (Part-6)	$\mu g/m^3$	15.94	80
5.	Ozone as O_3	IS:5182 (Part-9)	$\mu g/m^3$	BDL(<20)	100
6.	NH_3	CPCB manual & 401-Method Air sampling & analysis, 3rd Edition	$\mu g/m^3$	23.81	400
7.	Lead	IS:5182 (Part-22)	$\mu g/m^3$	BDL(<0.05)	1 (24 hour average)
8.	Nickel	CPCB Guidelines 1988	ng/m^3	BDL(<4)	20 (Annual average)

BDL- Below Detection Limit

Tested By

(Leena Sharma)
Chemist

Authorized Signatory

(Amreesh Kumar)
Lab Incharge
Environmental & Chemical Laboratory
Wolkem India Limited
E-102, M.I.A., UDAIPUR (Rajasthan)

Note

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End of Report

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www.wolkem.com

Report No. 20230531260/B

Report Issue Date: - 15.06.2023

TEST REPORT

1. **Name of Customer** : M/s J.K. Cement Works Mangrol, (Unit-Cement Plant), Tehsil - Nimbahera, District – Chittorgarh, State- Rajasthan (INDIA),
2. **Purchase Order Number** : 4600093211 Dated:- 13.06.2023
3. **Date & Time of Monitoring** : 26.05.2023/11:05AM
4. **Sample Identification** : Air Sample
5. **Condition of Sample** : Sealed/Ok
6. **Sample Received On** : 31.05.2023
7. **Period of Analysis** : 31.05.2023 to 14.06.2023
8. **Name of Location** : Near Factory Gate
9. **Method of Sampling** : IS: 5182(Part 11, 12) & Instrument Manual

S. No	Monitoring Details	Unit	Results
1.	Ambient Temperature	°C	31.9
2.	Relative Humidity	%	48

Results Ambient Air Quality

S. No	Parameters	Test Method	Unit	Results	NAAQS (CPCB Norms) New Delhi dt. 18th Nov. 2009
Chemical Testing - Atmospheric Pollution - Ambient Air					
1.	CO	BY CO Meter	mg/m^3	0.32	04 (1 hour)
2.	Benzo(a)pyrene	IS:5182 (Part-12) NAAQS Guideline	ng/m^3	BDL(<0.01)	1 (Annual average)
3.	Arsenic	CPCB Guideline 2011	ng/m^3	BDL(<3)	6 (Annual average)
4.	Benzene	IS:5182 (Part-11) NAAQS Guideline	$\mu g/m^3$	BDL(<0.01)	5 (Annual average)

BDL- Below Detection Limit

Tested By

(Leena Sharma)
Chemist

Authorized Signatory

(Amreesh Kumar)
Lab Incharge

Environmental & Chemical Laboratory
Wolkem India Limited
E-102, M.I.A., UDAIPUR (Rajasthan)

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Report No. 20230531261/A

Report Issue Date: - 15.06.2023

TEST REPORT

1. **Name of Customer**	:	M/s J.K. Cement Works Mangrol, (Unit-Cement Plant), Tehsil - Nimbahera, District – Chittorgarh, State- Rajasthan (INDIA),
2. **Purchase Order Number**	:	4600093211 Dated:- 13.06.2023
3. **Date & Time of Monitoring**	:	26.05.2023/11:55AM
4 **Sample Identification**	:	Air Sample
5. **Condition of Sample**	:	Sealed/Ok
6. **Sample Received On**	:	31.05.2023
7. **Period of Analysis**	:	31.05.2023 to 14.06.2023
8. **Name of Location**	:	Near Colony Gate
9. **Method of Sampling**	:	IS: 5182(Part 2,6,9,22,23) & Instrument Manual

S. No	Monitoring Details	Unit	Results
1.	Duration of Survey	Minutes	1440.7
2.	Average Flow rate for PM_{10}	M^3/ Min	1.12
3.	Ambient Temperature	°C	32.5
4.	Relative Humidity	%	47

Results Ambient Air Quality

S. No	Parameters	Test Method	Unit	Results	NAAQS (CPCB Norms) New Delhi dt. 18th Nov. 2009
Chemical Testing - Atmospheric Pollution - Ambient Air					
1.	PM_{10}	IS:5182 (Part-23)	$\mu g/m^3$	62.32	100
2.	$PM_{2.5}$	WIL/SOP No. 10/25 Issue date 01.05.2019	$\mu g/m^3$	28.43	60
3.	SO_2	IS:5182 (Part-2)	$\mu g/m^3$	BDL(<6)	80
4.	NO_2	IS:5182 (Part-6)	$\mu g/m^3$	13.97	80
5.	Ozone as O_3	IS:5182 (Part-9)	$\mu g/m^3$	BDL(<20)	100
6.	NH_3	CPCB manual & 401-Method Air sampling & analysis, 3rd Edition	$\mu g/m^3$	22.11	400
7.	Lead	IS:5182 (Part-22)	$\mu g/m^3$	BDL(<0.05)	1 (24 hour average)
8.	Nickel	CPCB Guidelines 1988	ng/m^3	BDL(<4)	20 (Annual average)

BDL- Below Detection Limit

Tested By

(Leena Sharma)
Chemist

Authorized Signatory

(Amreesh Kumar)
Lab Incharge
Environmental & Chemical Laboratory
Wolkem India Limited
E-102, M.I.A., UDAIPUR (Rajasthan)

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Report No. 20230531261/B

Report Issue Date: - 15.06.2023

TEST REPORT

1. **Name of Customer** : M/s J.K. Cement Works Mangrol, (Unit-Cement Plant), Tehsil - Nimbahera, District – Chittorgarh, State- Rajasthan (INDIA).
2. **Purchase Order Number** : 4600093211 Dated:- 13.06.2023
3. **Date & Time of Monitoring** : 26.05.2023/11:55AM
4. **Sample Identification** : Air Sample
5. **Condition of Sample** : Sealed/Ok
6. **Sample Received On** : 31.05.2023
7. **Period of Analysis** : 31.05.2023 to 14.06.2023
8. **Name of Location** : Near Colony Gate
9. **Method of Sampling** : IS: 5182(Part 11, 12) & Instrument Manual

S. No	Monitoring Details	Unit	Results
1.	Ambient Temperature	°C	32.5
2.	Relative Humidity	%	47

Results Ambient Air Quality

S. No	Parameters	Test Method	Unit	Results	NAAQS (CPCB Norms) New Delhi dt. 18th Nov. 2009
Chemical Testing - Atmospheric Pollution - Ambient Air					
1.	CO	BY CO Meter	mg/m³	0.31	04 (1 hour)
2.	Benzo(a)pyrene	IS:5182 (Part-12) NAAQS Guideline	ng/m³	BDL(<0.01)	1 (Annual average)
3.	Arsenic	CPCB Guideline 2011	ng/m³	BDL(<3)	6 (Annual average)
4.	Benzene	IS:5182 (Part-11) NAAQS Guideline	µg/m³	BDL(<0.01)	5 (Annual average)

BDL- Below Detection Limit

Tested By

(Leena Sharma)
Chemist

Authorized Signatory

(Amreesh Kumar)
Lab Incharge
Environmental & Chemical Laboratory
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E-102, M.I.A., UDAIPUR (Rajasthan)

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Report Issue Date: 15.06.2023

TEST REPORT

1. **Name of Customer** : M/s J.K. Cement Works Mangrol, (Unit-Cement Plant), Tehsil - Nimbahera, District – Chittorgarh, State- Rajasthan (INDIA).
2. **Purchase order Number** : 4600093211 Dated:- 13.06.2023
3. **Date of Monitoring** : 27.05.2023
4. **Sample Identification** : Noise Sample
5. **Condition of Sample** : NA
6. **Sample Received On** : 31.05.2023
7. **Period of Analysis** : NA
8. **Test Methods Reference** : IS: 9989– 1981 (Reaffirmed 2014)

Noise Level Monitoring Results

S. No	Station Point	Report No.	Sound pressure Level dB Day Time		Sound pressure Level dB Night Time	
			Maximum	Minimum	Maximum	Minimum
1.	Near Time Office	20230531262	63.1	57.4	53.1	47.5
2.	Near Thermal Power Plant	20230531263	66.7	59.7	54.9	49.7
3.	Near Factory Gate	20230531264	63.6	56.3	52.2	48.8
4.	Near Colony Gate	20230531265	65.5	59.9	54.6	47.2

CPCB Norms

S. No	Category of area	Day time dB 6.00 AM to 10.00PM	Night Time dB 10.00PM to 6.00am
1.	Industrial area	75.0	70.0
2.	Commercial area	65.0	55.0
3.	Residential area	55.0	45.0
4.	Silence area	50.0	40.0

Tested By

(Leena Sharma)
Chemist

Authorized Signatory

(Ahreesh Kumar)
Lab Incharge
Environmental & Chemical Laboratory
Wolkem India Limited
E-102, M.I.A., UDAIPUR (Rajasthan)

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Report No. 20230811022

Report Issue Date: - 22.08.2023

TEST REPORT

1. Name of Customer	:	M/s J.K. Cement Works Mangrol, Tehsil - Nimbahera,District – Chittorgarh, State- Rajasthan (INDIA),
2. Purchase order Number	:	4600093211 Dated:- 13.06.2023
3. Sample Identification	:	Waste water
4. Condition of Sample	:	Sealed/Ok
5. Date & Time of Sampling	:	10.08.2023/04:00PM
6. Sample received on	:	11.08.2023
7. Period of Analysis	:	11.08.2023 to 22.08.2023
8. Name of Sample & Location	:	Treated waste water source (STP Sushila Nagar Colony)
9. Method of Sampling	:	IS:3025 (Pt 1) 1987

S. No	Environment Condition	Unit	Results
1.	Ambient Temperature	°C	33.2
2.	Relative Humidity	%	52

S. No.	Parameters	Test Method	Unit	Results	Limits as per Environment Protection rules,1986
Chemical Testing– Pollution and Environment - Waste Water					
1.	pH (at 27°C)	IS:3025(Part-11)	-	7.52	5.5-9.0
2.	Total Suspended Solid	IS:3025(Part-17)	mg/L	22	-
3.	Oil & Grease	IS:3025(Part-39)	mg/L	3.6	10
4.	B.O.D. 3 days @27°C	IS:3025(Part-44)	mg/L	16.2	30
5.	Chemical Oxygen Demand	IS:3025 (Part-58)	mg/L	109.76	250
6.	Residual Chlorine	IS:3025(Part-26)	mg/L	BDL(<0.01)	1.0
7.	Chlorides as Cl-	IS:3025(Part-32)	mg/L	152	-
8.	Sulphide	APHA 23rd Ed., 4500-S2- Page 4-181 to 183	mg/L	0.10	2.0
9.	Ammonical Nitrogen (as NH4-N)	APHA 23rd Ed., 4500 NH3-B	mg/L	9.14	50

BDL-Below Detection Limit

Tested By
(Manali Vyas)
Asst.Chemist

Authorized Signatory
(Puran Singh)
Sr.Chemist
Environmental & Chemical Laboratory
Wolkem India Limited
E-102, M.I.A., UDAIPUR (Rajasthan)

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End of Report

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Report No.20230811052 Report Issue Date: - 22.08.2023

TEST REPORT

1. Name of Customer	:	M/s J.K. Cement Works Mangrol, Tehsil - Nimbahera,District – Chittorgarh, State- Rajasthan (INDIA),
2. Purchase Order No.	:	4600093211 Dated:- 13.06.2023
3. Sample Identification	:	Waste water
4. Condition of sample	:	Sealed/Ok
5. Source/ Location	:	Treated waste water source (STP Sushila Nagar Colony)
6. Sampling done by	:	Environmental & Chemical Laboratory, Wolkem India Limited
7. Sample Received on	:	11.08.2023
8. Period of Testing	:	11.08.2023 to 17.08.2023
9. Environmental conditions	:	Temp 33.2°C/ RH 52%
10. Sampling method	:	IS: 1622-1981

S. No.	Parameters	Test Method	Unit	Results	Limits as per Environment Protection rules, 1986
Biological Testing – Water- Waste water					
1.	Faecal Coliforms	IS 1622:1981	MPN/ 100ml	240	-

Authorized Signatory

Amreesh Kumar
(Head & Dy. GM)
Microbiology Testing Laboratory
Wolkem India Limited
E-102, M.I.A., UDAIPUR (Rajasthan)

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4. The samples will be destroyed after 07 days from the date of issue of test certificate unless otherwise specified.
5. Any discrepancy in test results should be reported within 03 days.

End of Report

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Report No. 20230526056

Report Issue Date: - 14.06.2023

TEST REPORT

1. Name of Customer	:	M/s J.K. Cement Works Mangrol, (Unit-Cement Plant), Tehsil - Nimbahera, District – Chittorgarh, State- Rajasthan (INDIA),
2. Purchase order Number	:	4600093211 Dated:- 13.06.2023
3. Sample Identification	:	Waste water
4. Condition of Sample	:	Sealed/Ok
5. Date & Time of Sampling	:	25.05.2023/01:20PM
6. Sample received on	:	26.05.2023
7. Period of Analysis	:	26.05.2023 to 09.06.2023
8. Name of Sample & Location	:	ETP (WHRS-29.1) water
9. Method of Sampling	:	IS:3025 (Pt 1) 1987

S. No	Environment Condition	Unit	Results
1.	Ambient Temperature	°C	33.5
2.	Relative Humidity	%	25

S. No.	Parameters	Test Method	Unit	Results	Limits as per Environment Protection rules,1986
Chemical Testing– Pollution and Environment - Waste Water					
1.	pH (at 27°C)	IS:3025(Part-11)	-	7.66	6.5-8.5
2.	Total Suspended Solid	IS:3025(Part-17)	mg/L	34	100
3.	Oil & Grease	IS:3025(Part-39)	mg/L	3.0	10
4.	B.O.D. 3 days @27°C	IS:3025(Part-44)	mg/L	11.4	30
5.	Chemical Oxygen Demand	IS:3025 (Part-58)	mg/L	90.46	250
6.	Residual Chlorine	IS:3025(Part-26)	mg/L	BDL(<0.01)	1.0
7.	Phosphate as PO_4	IS:3025(Part-31)	mg/L	0.58	5.0
Chemical Testing – Residues – Waste water					
8.	Copper as Cu	APHA 23rd Ed.3111B	mg/L	BDL(<0.1)	1.0
9.	Zinc	APHA 23rd Ed.3111B	mg/L	0.12	1.0
10.	Iron as Fe	APHA 23rd Ed.3111B	mg/L	BDL(<0.1)	1.0
11.	Total Chromium	APHA 23rd Ed.3111B	mg/L	BDL(<0.02)	0.2

BDL-Below Detection Limit

Tested By
(Manali Vyas)
Asst.Chemist

Authorized Signatory
(Puran Singh)
Sr.Chemist
Environmental & Chemical Laboratory
Wolkem India Limited
E-102, M.I.A., UDAIPUR (Rajasthan)

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__End of Report__

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www.wolkem.com

Report No. 20230526057

Report Issue Date: - 14.06.2023

TEST REPORT

1. Name of Customer	:	M/s J.K. Cement Works Mangrol, (Unit-Cement Plant), Tehsil - Nimbahera, District – Chittorgarh, State- Rajasthan (INDIA),
2. Purchase order Number	:	4600093211 Dated:- 13.06.2023
3. Sample Identification	:	Waste water
4. Condition of Sample	:	Sealed/Ok
5. Date & Time of Sampling	:	25.05.2023/01:35PM
6. Sample received on	:	26.05.2023
7. Period of Analysis	:	26.05.2023 to 09.06.2023
8. Name of Sample & Location	:	ETP (CPP 25MW) water
9. Method of Sampling	:	IS:3025 (Pt 1) 1987

S. No	Environment Condition	Unit	Results
1.	Ambient Temperature	°C	33.9
2.	Relative Humidity	%	24

S. No.	Parameters	Test Method	Unit	Results	Limits as per Environment Protection rules,1986
Chemical Testing– Pollution and Environment - Waste Water					
1.	pH (at 27°C)	IS:3025(Part-11)	-	7.84	6.5-8.5
2.	Total Suspended Solid	IS:3025(Part-17)	mg/L	28	100
3.	Oil & Grease	IS:3025(Part-39)	mg/L	2.8	10
4.	B.O.D. 3 days @27°C	IS:3025(Part-44)	mg/L	10.2	30
5.	Chemical Oxygen	IS:3025 (Part-58)	mg/L	82.24	250
6.	Residual Chlorine	IS:3025(Part-26)	mg/L	BDL(<0.01)	1.0
7.	Phosphate as PO_4	IS:3025(Part-31)	mg/L	0.50	5.0
Chemical Testing – Residues – Waste water					
8.	Copper as Cu	APHA 23rd Ed.3111B	mg/L	BDL(<0.1)	1.0
9.	Zinc	APHA 23rd Ed.3111B	mg/L	BDL(<0.1)	1.0
10.	Iron as Fe	APHA 23rd Ed.3111B	mg/L	BDL(<0.1)	1.0
11.	Total Chromium	APHA 23rd Ed.3111B	mg/L	BDL(<0.02)	0.2

BDL-Below Detection Limit

Tested By
(Manali Vyas)
Asst.Chemist

Authorized Signatory
(Puran Singh)
Sr.Chemist
Environmental & Chemical Laboratory
Wolkem India Limited
E-102, M.I.A., UDAIPUR (Rajasthan)

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__End of Report__

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www.wolkem.com

Report No. 20230526036/A

Report Issue Date: - 14.06.2023

TEST REPORT

1. **Name of Customer** : Sushila Nagar Resenditial Township, M/s J.K. Cement Works Mangrol, (Unit-Group Housing), Tehsil - Nimbahera, District – Chittorgarh, State- Rajasthan (INDIA).
2. **Purchase order Number** : 4600093211 Dated:- 13.06.2023
3. **Sample Identification** : Ground water
4. **Condition of Sample** : Sealed/Ok
5. **Date & Time of Sampling** : 24.05.2023/01:10PM
6. **Sample received on** : 26.05.2023
7. **Period of Analysis** : 26.05.2023 to 09.06.2023
8. **Name of Sample & Location** : Bore well No. 1
9. **Method of Sampling** : IS:3025 (Pt 1) 1987

S. No.	Parameters	Test Method	Unit	Results	Limits :- IS-10500:2012 Acceptable	Permissible
Chemical Testing – Residues – Ground water						
22	Total Chromium	APHA 23rd Ed.3111B	mg/L	BDL(<0.02)	0.05	No Relaxation
23	Cadmium as Cd	APHA 23rd Ed.3111B	mg/L	BDL(<0.01)	0.003	No Relaxation
24	Copper as Cu	APHA 23rd Ed.3111B	mg/L	BDL(<0.1)	0.05	1.5
25	Zinc	APHA 23rd Ed.3111B	mg/L	0.12	5	15
26	Iron as Fe	APHA 23rd Ed.3111B	mg/L	0.10	0.3	No Relaxation
27	Aluminium	APHA 23rd Ed.3111D	mg/L	BDL(<0.5)	0.03	0.2
28	Arsenic	APHA 23rd Ed.3114C	mg/L	BDL(<0.05)	-	-
29	Selenium	APHA 23rd Ed.3111C	mg/L	BDL(<0.05)	0.01	No Relaxation
30	Barium	APHA 23rd Ed.3111D	mg/L	BDL(<0.01)	0.7	No Relaxation
31	Manganese as Mn	APHA 23rd Ed.3111B	mg/L	BDL(<0.01)	0.1	0.3

BDL-Below Detection Limit

Tested By
(Manali Vyas)
Asst.Chemist

Authorized Signatory
(Puran Singh)
Sr.Chemist
Environmental & Chemical Laboratory
Wolkem India Limited
E-102, M.I.A., UDAIPUR (Rajasthan)

Note
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End of Report

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www.wolkem.com

Report No. 20230526036/B

Report Issue Date: - 14.06.2023

TEST REPORT

1. Name of Customer	:	Sushila Nagar Resenditial Township, M/s J.K. Cement Works Mangrol, (Unit-Group Housing), Tehsil - Nimbahera, District – Chittorgarh, State- Rajasthan (INDIA).
2. Purchase order Number	:	4600093211 Dated:- 13.06.2023
3. Sample Identification	:	Ground water
4. Condition of Sample	:	Sealed/Ok
5. Date & Time of Sampling	:	24.05.2023/01:10PM
6. Sample received on	:	26.05.2023
7. Period of Analysis	:	26.05.2023 to 09.06.2023
8. Name of Sample & Location	:	Bore well No. 1
9. Method of Sampling	:	IS:3025 (Pt 1) 1987

S. No	Environment Condition	Unit	Results
1.	Ambient Temperature	°C	34.4
2.	Relative Humidity	%	25

S. No	Parameters	Test Method	Unit	Results	Limits- IS:10500:2012	
					Acceptable	Permissible
Chemical Testing – Water – Ground Water						
1.	Silver as Ag	Annex J of IS 13428	mg/L	BDL(<0.1)	0.1	No Relaxation
2.	Nickel as Ni	APHA 23rd Ed.,3111B	mg/L	BDL(<0.01)	0.02	No Relaxation
3.	Phenolic Compounds as C_6H_5OH	IS:3025 (Part-43)	mg/L	BDL(<0.001)	0.001	0.002
4.	Anionic Detergent as MBAS	Annex K of IS 13428	mg/L	BDL(<0.1)	0.2	1.0

Authorized Signatory

Tested By

(Manali Vyas)
Asst.Chemist

(Puran Singh)
Sr.Chemist
Environmental & Chemical Laboratory
Wolkem India Limited
E-102, M.I.A., UDAIPUR (Rajasthan)

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Phone : 91 294 2494600 to 02 E-mail : info.wcs@wolkem.com
www.wolkem.com

Report No. 20230526037/A

Report Issue Date: - 14.06.2023

TEST REPORT

1. Name of Customer : Sushila Nagar Resenditial Township, M/s J.K. Cement Works Mangrol, (Unit-Group Housing), Tehsil - Nimbahera, District – Chittorgarh, State- Rajasthan (INDIA),

2. Purchase order Number : 4600093211 Dated:- 13.06.2023

3. Sample Identification : Ground water

4. Condition of Sample : Sealed/Ok

5. Date & Time of Sampling : 24.05.2023/01:20PM

6. Sample received on : 26.05.2023

7. Period of Analysis : 26.05.2023 to 09.06.2023

8. Name of Sample & Location : Bore well No. 2

9. Method of Sampling : IS:3025 (Pt 1) 1987

S. No	Environment Condition	Unit	Results
1.	Ambient Temperature	°C	34.6
2.	Relative Humidity	%	24

S. No.	Parameters	Test Method	Unit	Results	Limits :- IS-10500:2012 Acceptable	Permissible
Chemical Testing – Water- Ground Water						
1.	pH (at 27°C)	IS:3025(Part-11)	-	7.01	6.5 to 8.5	No Relaxation
2.	Conductivity (at 25°C)	IS:3025(Part-14)	µs	1130	-	-
3.	Color	IS:3025(Part-4)	Hazen	<5	5	15
4.	Odour	IS:3025(Part-5)	-	Agreeable	Agreeable	Agreeable
5.	Taste	IS:3025(Part-7)	-	Agreeable	Agreeable	Agreeable
6.	Turbidity	IS:3025(Part-10)	NTU	0.70	1	5
7.	Total Dissolve Solid	IS:3025(Part-16)	mg/L	690	500	2000
8.	Total Hardness as $CaCo_3$	IS:3025(Part-21)	mg/L	424	200	600
9.	Calcium as Ca^{2+}	IS:3025(Part-40)	mg/L	118.4	75	200
10.	Magnesium as Mg^{2+}	IS:3025(Part-46)	mg/L	30.7	30	100
11.	Alkalinity	IS:3025(Part-23)	mg/L	156	200	600
12.	Chlorides as Cl^-	IS:3025(Part-32)	mg/L	74	250	1000
13.	Residual Chlorine	IS:3025(Part-26)	mg/L	BDL(<0.01)	0.2	1
14.	Fluoride as F-	APHA 23rd Ed., 4500 FD	mg/L	0.50	1.0	1.5
15.	Sulphate as SO4	APHA 23rd Ed.4500 SO4 E	mg/L	56.3	200	400
16.	Sulphide	APHA 23rd Ed., 4500-S2- Page 4-181 to 183	mg/L	BDL(<0.01)	0.05	No Relaxation
17.	Nitrate as NO_3	APHA 23rd Ed., 4500 NO3 B	mg/L	9.8	45	No Relaxation
18.	Free Ammonia	APHA 23rd Ed., 2017,4500-NH3 C Page 4-116	mg/L	BDL(<0.5)	0.5	No Relaxation
19.	Settleable Solid	APHA 23rd Ed., 2540F	ml/L	BDL(<5.0)	-	-
20.	Boron	IS:3025(Part-57)	mg/L	BDL(<0.1)	0.5	1.0
21.	Chloramines	IS:3025(Part-26)	mg/L	BDL(<0.01)	4.0	No Relaxation

Note

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Phone : 91 294 2494600 to 02 E-mail : info.wcs@wolkem.com
www.wolkem.com

Report No. 20230526037/A

Report Issue Date: - 14.06.2023

TEST REPORT

1. Name of Customer	:	Sushila Nagar Resenditial Township, M/s J.K. Cement Works Mangrol, (Unit-Group Housing), Tehsil - Nimbahera, District – Chittorgarh, State- Rajasthan (INDIA),
2. Purchase order Number	:	4600093211 Dated:- 13.06.2023
3. Sample Identification	:	Ground water
4. Condition of Sample	:	Sealed/Ok
5. Date & Time of Sampling	:	24.05.2023/01:20PM
6. Sample received on	:	26.05.2023
7. Period of Analysis	:	26.05.2023 to 09.06.2023
8. Name of Sample & Location	:	Bore well No. 2
9. Method of Sampling	:	IS:3025 (Pt 1) 1987

S. No.	Parameters	Test Method	Unit	Results	Limits :- IS-10500:2012	
					Acceptable	Permissible
Chemical Testing – Residues – Ground water						
22.	Total Chromium	APHA 23rd Ed.3111B	mg/L	BDL(<0.02)	0.05	No Relaxation
23.	Cadmium as Cd	APHA 23rd Ed.3111B	mg/L	BDL(<0.01)	0.003	No Relaxation
24.	Copper as Cu	APHA 23rd Ed.3111B	mg/L	BDL(<0.1)	0.05	1.5
25.	Zinc	APHA 23rd Ed.3111B	mg/L	BDL(<0.1)	5	15
26.	Iron as Fe	APHA 23rd Ed.3111B	mg/L	BDL(<0.1)	0.3	No Relaxation
27.	Aluminium	APHA 23rd Ed.3111D	mg/L	BDL(<0.5)	0.03	0.2
28.	Arsenic	APHA 23rd Ed.3114C	mg/L	BDL(<0.05)	-	-
29.	Selenium	APHA 23rd Ed.3111C	mg/L	BDL(<0.05)	0.01	No Relaxation
30.	Barium	APHA 23rd Ed.3111D	mg/L	BDL(<0.01)	0.7	No Relaxation
31.	Manganese as Mn	APHA 23rd Ed.3111B	mg/L	BDL(<0.01)	0.1	0.3

BDL-Below Detection Limit

Tested By

(Manali Vyas)
Asst.Chemist

Authorized Signatory

(Puran Singh)
Sr.Chemist

Environmental & Chemical Laboratory
Wolkem India Limited
E-102, M.I.A., UDAIPUR (Rajasthan)

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CIN- U29299RJ1971PLC001379

Report No. 20230526037/B

Report Issue Date: - 14.06.2023

TEST REPORT

1. Name of Customer : Sushila Nagar Resenditial Township, M/s J.K. Cement Works Mangrol, (Unit-Group Housing), Tehsil - Nimbahera, District – Chittorgarh, State- Rajasthan (INDIA),

2. Purchase order Number : 4600093211 Dated:- 13.06.2023

3. Sample Identification : Ground water

4. Condition of Sample : Sealed/Ok

5. Date & Time of Sampling : 24.05.2023/01:20PM

6. Sample received on : 26.05.2023

7. Period of Analysis : 26.05.2023 to 09.06.2023

8. Name of Sample & Location : Bore well No. 2

9. Method of Sampling : IS:3025 (Pt 1) 1987

S. No	Environment Condition	Unit	Results
1.	Ambient Temperature	°C	34.6
2.	Relative Humidity	%	24

S. No	Parameters	Test Method	Unit	Results	Limits- IS:10500:2012	
					Acceptable	Permissible
Chemical Testing – Water – Ground Water						
1.	Silver as Ag	Annex J of IS 13428	mg/L	BDL(<0.1)	0.1	No Relaxation
2.	Nickel as Ni	APHA 23rd Ed.,3111B	mg/L	BDL(<0.01)	0.02	No Relaxation
3.	Phenolic Compounds as C_6H_5OH	IS:3025 (Part-43)	mg/L	BDL(<0.001)	0.001	0.002
4.	Anionic Detergent as MBAS	Annex K of IS 13428	mg/L	BDL(<0.1)	0.2	1.0

Tested By

(Manali Vyas)
Asst.Chemist

Authorized Signatory

(Puran Singh)
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www.wolkem.com

Report No. 20230526038/A

Report Issue Date: - 14.06.2023

TEST REPORT

1. Name of Customer : Sushila Nagar Resenditial Township, M/s J.K. Cement Works Mangrol, (Unit-Group Housing), Tehsil - Nimbahera, District – Chittorgarh, State- Rajasthan (INDIA).
2. Purchase order Number : 4600093211 Dated:- 13.06.2023
3. Sample Identification : Ground water
4. Condition of Sample : Sealed/Ok
5. Date & Time of Sampling : 24.05.2023/01:35PM
6. Sample received on : 26.05.2023
7. Period of Analysis : 26.05.2023 to 09.06.2023
8. Name of Sample & Location : Bore well No. 3
9. Method of Sampling : IS:3025 (Pt 1) 1987

S. No	Environment Condition	Unit	Results
1.	Ambient Temperature	°C	34.6
2.	Relative Humidity	%	26

S. No.	Parameters	Test Method	Unit	Results	Limits :- IS-10500:2012	
					Acceptable	Permissible
Chemical Testing – Water- Ground Water						
1.	pH (at 27°C)	IS:3025(Part-11)	-	7.74	6.5 to 8.5	No Relaxation
2.	Conductivity (at 25°C)	IS:3025(Part-14)	µs	580.6	-	-
3.	Color	IS:3025(Part-4)	Hazen	<5	5	15
4.	Odour	IS:3025(Part-5)	-	Agreeable	Agreeable	Agreeable
5.	Taste	IS:3025(Part-7)	-	Agreeable	Agreeable	Agreeable
6.	Turbidity	IS:3025(Part-10)	NTU	0.60	1	5
7.	Total Dissolve Solid	IS:3025(Part-16)	mg/L	382	500	2000
8.	Total Hardness as $CaCo_3$	IS:3025(Part-21)	mg/L	196	200	600
9.	Calcium as Ca^{2+}	IS:3025(Part-40)	mg/L	57.6	75	200
10.	Magnesium as Mg^{2+}	IS:3025(Part-46)	mg/L	12.5	30	100
11.	Alkalinity	IS:3025(Part-23)	mg/L	128	200	600
12.	Chlorides as Cl	IS:3025(Part-32)	mg/L	88	250	1000
13.	Residual Chlorine	IS:3025(Part-26)	mg/L	BDL(<0.01)	0.2	1
14.	Fluoride as F-	APHA 23rd Ed., 4500 FD	mg/L	0.40	1.0	1.5
15.	Sulphate as SO4	APHA 23rd Ed 4500 SO4 E	mg/L	39.2	200	400
16.	Sulphide	APHA 23rd Ed., 4500-S2- Page 4-181 to 183	mg/L	BDL(<0.01)	0.05	No Relaxation
17.	Nitrate as NO_3	APHA 23rd Ed., 4500 NO_3 B	mg/L	6.8	45	No Relaxation
18.	Free Ammonia	APHA 23rd Ed., 2017,4500-NH3 C Page 4-116	mg/L	BDL(<0.5)	0.5	No Relaxation
19.	Settleable Solid	APHA 23rd Ed., 2540F	ml/L	BDL(<5.0)	-	-
20.	Boron	IS:3025(Part-57)	mg/L	BDL(<0.1)	0.5	1.0
21.	Chloramines	IS:3025(Part-26)	mg/L	BDL(<0.01)	4.0	No Relaxation

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Report No. 20230526038/A

Report Issue Date: - 14.06.2023

TEST REPORT

1. Name of Customer : Sushila Nagar Resenditial Township, M/s J.K. Cement Works Mangrol, (Unit-Group Housing), Tehsil - Nimbahera, District – Chittorgarh, State- Rajasthan (INDIA),
2. Purchase order Number : 4600093211 Dated:- 13.06.2023
3. Sample Identification : Ground water
4. Condition of Sample : Sealed/Ok
5. Date & Time of Sampling : 24.05.2023/01:35PM
6. Sample received on : 26.05.2023
7. Period of Analysis : 26.05.2023 to 09.06.2023
8. Name of Sample & Location : Bore well No. 3
9. Method of Sampling : IS:3025 (Pt 1) 1987

S. No.	Parameters	Test Method	Unit	Results	Limits :- IS-10500:2012	
					Acceptable	Permissible
Chemical Testing – Residues – Ground water						
22.	Total Chromium	APHA 23rd Ed.3111B	mg/L	BDL(<0.02)	0.05	No Relaxation
23.	Cadmium as Cd	APHA 23rd Ed.3111B	mg/L	BDL(<0.01)	0.003	No Relaxation
24.	Copper as Cu	APHA 23rd Ed.3111B	mg/L	BDL(<0.1)	0.05	1.5
25.	Zinc	APHA 23rd Ed.3111B	mg/L	BDL(<0.1)	5	15
26.	Iron as Fe	APHA 23rd Ed.3111B	mg/L	BDL(<0.1)	0.3	No Relaxation
27.	Aluminium	APHA 23rd Ed.3111D	mg/L	BDL(<0.5)	0.03	0.2
28.	Arsenic	APHA 23rd Ed.3114C	mg/L	BDL(<0.05)	-	-
29.	Selenium	APHA 23rd Ed.3111C	mg/L	BDL(<0.05)	0.01	No Relaxation
30.	Barium	APHA 23rd Ed.3111D	mg/L	BDL(<0.01)	0.7	No Relaxation
31.	Manganese as Mn	APHA 23rd Ed.3111B	mg/L	BDL(<0.01)	0.1	0.3

BDL-Below Detection Limit

Tested By
(Manali Vyas)
Asst.Chemist

Authorized Signatory
(Puran Singh)
Sr.Chemist
Environmental & Chemical Laboratory
Wolkem India Limited
E-102, M.I.A., UDAIPUR (Rajasthan)

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www.wolkem.com

Report No. 20230526038/B

Report Issue Date: - 14.06.2023

TEST REPORT

1. Name of Customer	:	Sushila Nagar Resenditial Township, M/s J.K. Cement Works Mangrol, (Unit-Group Housing), Tehsil - Nimbahera, District – Chittorgarh, State- Rajasthan (INDIA),
2. Purchase order Number	:	4600093211 Dated:- 13.06.2023
3. Sample Identification	:	Ground water
4. Condition of Sample	:	Sealed/Ok
5. Date & Time of Sampling	:	24.05.2023/01:35PM
6. Sample received on	:	26.05.2023
7. Period of Analysis	:	26.05.2023 to 09.06.2023
8. Name of Sample & Location	:	Bore well No. 3
9. Method of Sampling	:	IS:3025 (Pt 1) 1987

S. No	Environment Condition	Unit	Results
1.	Ambient Temperature	°C	34.6
2.	Relative Humidity	%	26

S. No	Parameters	Test Method	Unit	Results	Limits- IS:10500:2012	
					Acceptable	Permissible
Chemical Testing – Water – Ground Water						
1.	Silver as Ag	Annex J of IS 13428	mg/L	BDL(<0.1)	0.1	No Relaxation
2.	Nickel as Ni	APHA 23rd Ed.,3111B	mg/L	BDL(<0.01)	0.02	No Relaxation
3.	Phenolic Compounds as C_6H_5OH	IS:3025 (Part-43)	mg/L	BDL(<0.001)	0.001	0.002
4.	Anionic Detergent as MBAS	Annex K of IS 13428	mg/L	BDL(<0.1)	0.2	1.0

Tested By

(Manali Vyas)
Asst.Chemist

Authorized Signatory

(Puran Singh)
Sr.Chemist

Environmental & Chemical Laboratory
Wolkem India Limited
E-102, M.I.A., UDAIPUR (Rajasthan)

Note

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Report No. 20230526039/A

Report Issue Date: - 14.06.2023

TEST REPORT

1. Name of Customer	:	Sushila Nagar Resenditial Township, M/s J.K. Cement Works Mangrol, (Unit-Group Housing), Tehsil - Nimbahera, District – Chittorgarh, State- Rajasthan (INDIA),
2. Purchase order Number	:	4600093211 Dated:- 13.06.2023
3. Sample Identification	:	Ground water
4. Condition of Sample	:	Sealed/Ok
5. Date & Time of Sampling	:	24.05.2023/01:50PM
6. Sample received on	:	26.05.2023
7. Period of Analysis	:	26.05.2023 to 09.06.2023
8. Name of Sample & Location	:	Bore well No. 4
9. Method of Sampling	:	IS:3025 (Pt 1) 1987

S. No	Environment Condition	Unit	Results
1.	Ambient Temperature	°C	34.8
2.	Relative Humidity	%	25

S. No.	Parameters	Test Method	Unit	Results	Limits :- IS-10500:2012	
					Acceptable	Permissible
Chemical Testing – Water- Ground Water						
1.	pH (at 27°C)	IS:3025(Part-11)	-	7.51	6.5 to 8.5	No Relaxation
2.	Conductivity (at 25°C)	IS:3025(Part-14)	µs	903.4	-	-
3.	Color	IS:3025(Part-4)	Hazen	<5	5	15
4.	Odour	IS:3025(Part-5)	-	Agreeable	Agreeable	Agreeable
5.	Taste	IS:3025(Part-7)	-	Agreeable	Agreeable	Agreeable
6.	Turbidity	IS:3025(Part-10)	NTU	0.90	1	5
7.	Total Dissolve Solid	IS:3025(Part-16)	mg/L	538	500	2000
8.	Total Hardness as $CaCo_3$	IS:3025(Part-21)	mg/L	292	200	600
9.	Calcium as Ca^{2+}	IS:3025(Part-40)	mg/L	73.6	75	200
10.	Magnesium as Mg^{2+}	IS:3025(Part-46)	mg/L	25.9	30	100
11.	Alkalinity	IS:3025(Part-23)	mg/L	96	200	600
12.	Chlorides as Cl	IS:3025(Part-32)	mg/L	82	250	1000
13.	Residual Chlorine	IS:3025(Part-26)	mg/L	BDL(<0.01)	0.2	1
14.	Fluoride as F-	APHA 23rd Ed., 4500 FD	mg/L	0.45	1.0	1.5
15.	Sulphate as SO4	APHA 23rd Ed.4500 SO4 E	mg/L	57.8	200	400
16.	Sulphide	APHA 23rd Ed., 4500-S2- Page 4-181 to 183	mg/L	BDL(<0.01)	0.05	No Relaxation
17.	Nitrate as NO_3	APHA 23rd Ed., 4500 NO3 B	mg/L	8.3	45	No Relaxation
18.	Free Ammonia	APHA 23rd Ed., 2017,4500-NH3 C Page 4-116	mg/L	BDL(<0.5)	0.5	No Relaxation
19.	Settleable Solid	APHA 23rd Ed., 2540F	ml/L	BDL(<5.0)	-	-
20.	Boron	IS:3025(Part-57)	mg/L	BDL(<0.1)	0.5	1.0
21.	Chloramines	IS:3025(Part-26)	mg/L	BDL(<0.01)	4.0	No Relaxation

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www.wolkem.com

Report No. 20230526039/A

Report Issue Date: - 14.06.2023

TEST REPORT

1. Name of Customer	:	Sushila Nagar Resenditial Township, M/s J.K. Cement Works Mangrol, (Unit-Group Housing), Tehsil - Nimbahera, District – Chittorgarh, State- Rajasthan (INDIA).
2. Purchase order Number	:	4600093211 Dated:- 13.06.2023
3. Sample Identification	:	Ground water
4. Condition of Sample	:	Sealed/Ok
5. Date & Time of Sampling	:	24.05.2023/01:50PM
6. Sample received on	:	26.05.2023
7. Period of Analysis	:	26.05.2023 to 09.06.2023
8. Name of Sample & Location	:	Bore well No. 4
9. Method of Sampling	:	IS:3025 (Pt 1) 1987

S. No.	Parameters	Test Method	Unit	Results	Limits :- IS-10500:2012	
					Acceptable	Permissible
Chemical Testing – Residues – Ground water						
22.	Total Chromium	APHA 23rd Ed.3111B	mg/L	BDL(<0.02)	0.05	No Relaxation
23.	Cadmium as Cd	APHA 23rd Ed.3111B	mg/L	BDL(<0.01)	0.003	No Relaxation
24.	Copper as Cu	APHA 23rd Ed.3111B	mg/L	BDL(<0.1)	0.05	1.5
25.	Zinc	APHA 23rd Ed.3111B	mg/L	BDL(<0.1)	5	15
26.	Iron as Fe	APHA 23rd Ed.3111B	mg/L	0.11	0.3	No Relaxation
27.	Aluminium	APHA 23rd Ed.3111D	mg/L	BDL(<0.5)	0.03	0.2
28.	Arsenic	APHA 23rd Ed.3114C	mg/L	BDL(<0.05)	-	-
29.	Selenium	APHA 23rd Ed.3111C	mg/L	BDL(<0.05)	0.01	No Relaxation
30.	Barium	APHA 23rd Ed.3111D	mg/L	BDL(<0.01)	0.7	No Relaxation
31.	Manganese as Mn	APHA 23rd Ed.3111B	mg/L	BDL(<0.01)	0.1	0.3

BDL-Below Detection Limit

Tested By

(Manali Vyas)
Asst.Chemist

Authorized Signatory

(Puran Singh)
Sr.Chemist

Environmental & Chemical Laboratory
Wolkem India Limited
E-102, M.I.A., UDAIPUR (Rajasthan)

Note

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www.wolkem.com

Report No. 20230526039/B

Report Issue Date: - 14.06.2023

TEST REPORT

1. Name of Customer	:	Sushila Nagar Resenditial Township, M/s J.K. Cement Works Mangrol, (Unit-Group Housing), Tehsil - Nimbahera, District – Chittorgarh, State- Rajasthan (INDIA),
2. Purchase order Number	:	4600093211 Dated:- 13.06.2023
3. Sample Identification	:	Ground water
4. Condition of Sample	:	Sealed/Ok
5. Date & Time of Sampling	:	24.05.2023/01:50PM
6. Sample received on	:	26.05.2023
7. Period of Analysis	:	26.05.2023 to 09.06.2023
8. Name of Sample & Location	:	Bore well No. 4
9. Method of Sampling	:	IS:3025 (Pt 1) 1987

S. No	Environment Condition	Unit	Results
1.	Ambient Temperature	°C	34.8
2.	Relative Humidity	%	25

S. No	Parameters	Test Method	Unit	Results	Limits- IS:10500:2012	
					Acceptable	Permissible
Chemical Testing – Water – Ground Water						
1.	Silver as Ag	Annex J of IS 13428	mg/L	BDL(<0.1)	0.1	No Relaxation
2.	Nickel as Ni	APHA 23rd Ed.,3111B	mg/L	BDL(<0.01)	0.02	No Relaxation
3.	Phenolic Compounds as C_6H_5OH	IS:3025 (Part-43)	mg/L	BDL(<0.001)	0.001	0.002
4.	Anionic Detergent as MBAS	Annex K of IS 13428	mg/L	BDL(<0.1)	0.2	1.0

Tested By

(Manali Vyas)
Asst.Chemist

Authorized Signatory

(Puran Singh)
Sr.Chemist

Environmental & Chemical Laboratory
Wolkem India Limited
E-102, M.I.A., UDAIPUR (Rajasthan)

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www.wolkem.com

Report No. 20230526040/A

Report Issue Date: - 14.06.2023

TEST REPORT

1. Name of Customer	:	Sushila Nagar Resenditial Township, M/s J.K. Cement Works Mangrol, (Unit-Group Housing), Tehsil - Nimbahera, District – Chittorgarh, State- Rajasthan (INDIA).
2. Purchase order Number	:	4600093211 Dated:- 13.06.2023
3. Sample Identification	:	Ground water
4. Condition of Sample	:	Sealed/Ok
5. Date & Time of Sampling	:	24.05.2023/02:10PM
6. Sample received on	:	26.05.2023
7. Period of Analysis	:	26.05.2023 to 09.06.2023
8. Name of Sample & Location	:	Bore well No. 5
9. Method of Sampling	:	IS:3025 (Pt 1) 1987

S. No	Environment Condition	Unit	Results
1.	Ambient Temperature	°C	33.8
2.	Relative Humidity	%	27

S. No.	Parameters	Test Method	Unit	Results	Limits :- IS-10500:2012	
					Acceptable	Permissible
Chemical Testing – Water- Ground Water						
1.	pH (at 27°C)	IS:3025(Part-11)	-	7.08	6.5 to 8.5	No Relaxation
2.	Conductivity (at 25°C)	IS:3025(Part-14)	µs	1231	-	-
3.	Color	IS:3025(Part-4)	Hazen	<5	5	15
4.	Odour	IS:3025(Part-5)	-	Agreeable	Agreeable	Agreeable
5.	Taste	IS:3025(Part-7)	-	Agreeable	Agreeable	Agreeable
6.	Turbidity	IS:3025(Part-10)	NTU	0.60	1	5
7.	Total Dissolve Solid	IS:3025(Part-16)	mg/L	758	500	2000
8.	Total Hardness as $CaCo_3$	IS:3025(Part-21)	mg/L	424	200	600
9.	Calcium as Ca^{2+}	IS:3025(Part-40)	mg/L	129.6	75	200
10.	Magnesium as Mg^{2+}	IS:3025(Part-46)	mg/L	24	30	100
11.	Alkalinity	IS:3025(Part-23)	mg/L	110	200	600
12.	Chlorides as Cl	IS:3025(Part-32)	mg/L	90	250	1000
13.	Residual Chlorine	IS:3025(Part-26)	mg/L	BDL(<0.01)	0.2	1
14.	Fluoride as F-	APHA 23rd Ed., 4500 FD	mg/L	0.55	1.0	1.5
15.	Sulphate as SO4	APHA 23rd Ed.4500 SO4 E	mg/L	66.7	200	400
16.	Sulphide	Apha 23rd Ed., 4500-S2- Page 4-181 to 183	mg/L	BDL(<0.01)	0.05	No Relaxation
17.	Nitrate as NO_3	APHA 23rd Ed., 4500 NO3 B	mg/L	10.2	45	No Relaxation
18.	Free Ammonia	APHA 23rd Ed., 2017,4500-NH3 C Page 4-116	mg/L	BDL(<0.5)	0.5	No Relaxation
19.	Settleable Solid	APHA 23rd Ed., 2540F	ml/L	BDL(<5.0)	-	-
20.	Boron	IS:3025(Part-57)	mg/L	BDL(<0.1)	0.5	1.0
21.	Chloramines	IS:3025(Part-26)	mg/L	BDL(<0.01)	4.0	No Relaxation

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Report No. 20230526040/A

Report Issue Date: - 14.06.2023

TEST REPORT

1. Name of Customer	:	Sushila Nagar Resenditial Township, M/s J.K. Cement Works Mangrol, (Unit-Group Housing), Tehsil - Nimbahera, District – Chittorgarh, State- Rajasthan (INDIA),
2. Purchase order Number	:	4600093211 Dated:- 13.06.2023
3. Sample Identification	:	Ground water
4. Condition of Sample	:	Sealed/Ok
5. Date & Time of Sampling	:	24.05.2023/02:10PM
6. Sample received on	:	26.05.2023
7. Period of Analysis	:	26.05.2023 to 09.06.2023
8. Name of Sample & Location	:	Bore well No. 5
9. Method of Sampling	:	IS:3025 (Pt 1) 1987

S. No.	Parameters	Test Method	Unit	Results	Limits :- IS-10500:2012	
					Acceptable	Permissible
Chemical Testing – Residues – Ground water						
22	Total Chromium	APHA 23rd Ed.3111B	mg/L	BDL(<0.02)	0.05	No Relaxation
23	Cadmium as Cd	APHA 23rd Ed.3111B	mg/L	BDL(<0.01)	0.003	No Relaxation
24	Copper as Cu	APHA 23rd Ed.3111B	mg/L	BDL(<0.1)	0.05	1.5
25	Zinc	APHA 23rd Ed.3111B	mg/L	0.11	5	15
26	Iron as Fe	APHA 23rd Ed.3111B	mg/L	BDL(<0.1)	0.3	No Relaxation
27	Aluminium	APHA 23rd Ed.3111D	mg/L	BDL(<0.5)	0.03	0.2
28	Arsenic	APHA 23rd Ed.3114C	mg/L	BDL(<0.05)	-	-
29	Selenium	APHA 23rd Ed.3111C	mg/L	BDL(<0.05)	0.01	No Relaxation
30	Banium	APHA 23rd Ed.3111D	mg/L	BDL(<0.01)	0.7	No Relaxation
31	Manganese as Mn	APHA 23rd Ed.3111B	mg/L	BDL(<0.01)	0.1	0.3

BDL-Below Detection Limit

Tested By

(Manali Vyas)
Asst.Chemist

Authorized Signatory

(Puran Singh)
Sr.Chemist
Environmental & Chemical Laboratory
Wolkem India Limited
E-102, M.I.A., UDAIPUR (Rajasthan)

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Report No. 20230526040/B

Report Issue Date: - 14.06.2023

TEST REPORT

1. Name of Customer	:	Sushila Nagar Resenditial Township, M/s J.K. Cement Works Mangrol, (Unit-Group Housing), Tehsil - Nimbahera, District – Chittorgarh, State- Rajasthan (INDIA).
2. Purchase order Number	:	4600093211 Dated:- 13.06.2023
3. Sample Identification	:	Ground water
4. Condition of Sample	:	Sealed/Ok
5. Date & Time of Sampling	:	24.05.2023/02:10PM
6. Sample received on	:	26.05.2023
7. Period of Analysis	:	26.05.2023 to 09.06.2023
8. Name of Sample & Location	:	Bore well No. 5
9. Method of Sampling	:	IS:3025 (Pt 1) 1987

S. No	Environment Condition	Unit	Results
1.	Ambient Temperature	°C	33.8
2.	Relative Humidity	%	27

S. No	Parameters	Test Method	Unit	Results	Limits- IS:10500:2012	
					Acceptable	Permissible
Chemical Testing – Water – Ground Water						
1.	Silver as Ag	Annex J of IS 13428	mg/L	BDL(<0.1)	0.1	No Relaxation
2.	Nickel as Ni	APHA 23rd Ed.,3111B	mg/L	BDL(<0.01)	0.02	No Relaxation
3.	Phenolic Compounds as C_6H_5OH	IS:3025 (Part-43)	mg/L	BDL(<0.001)	0.001	0.002
4.	Anionic Detergent as MBAS	Annex K of IS 13428	mg/L	BDL(<0.1)	0.2	1.0

Tested By

(Manali Vyas)
Asst.Chemist

Authorized Signatory

(Puran Singh)
Sr.Chemist

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Wolkem India Limited
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