

**KSK Mahanadi Power Company Limited**

CIN No. : U40300TG2009PLC064062

Works

Near Nariyara Village,
Akaltara Tehsil,
Janjgir - Champa District,
Chhattisgarh Pin : 495553
Tel (Site): 07817-284001

Registered Office

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Road No. 22 Jubilee Hills
Hyderabad - 500033,
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Ref.: MoEF&CC,RPUR/BPSN/2500108/846**Date: 1st Dec 2024**

To
Integrated Regional officer,
Ministry of Environment, Forests & Climate Change
Aranya Bhavan North Block, Sector-19
Naya Raipur, Atalnagar
Chhattisgarh, PIN: 492002

Sub: -Six Monthly Status of Compliance for Environmental Clearance granted to M/s KSK Mahanadi Power Company Limited (6x600 MW Coal Based Thermal Power Project) located at village- Nariyara, Tehsil- Akaltara, District-Janjgir, Champa, Chhattisgarh-Reg.

Ref: - i) Ministry's Letter No. - J13012/44/08 -IA.II (T), Dt. 19.10.2009
ii) Re-validation Letter No. - J-13012/44/2008-IA.II (T), Dt. 19.04.2018.

Sir,

With reference to the above subject and cited references, please find the enclosed Half yearly compliance report for the period **April 2024 to September 2024** in respect of the conditions stipulated in the environmental clearance granted to M/s KSK Mahanadi Power Company Limited.

For favour of your kind information and perusal please.

Thanking You.

Your's sincerely,
For **KSK Mahanadi Power company Limited**

Dr.M.V.R.N Acharyulu
(Authorized Signatory)

Encl: Six Monthly Environmental Clearance Compliance Report- **April'24 to Sept'24.**

Copy to: (1) The Member Secretary, CECB, Atal Nagar, Raipur, Chhattisgarh.

(2) The Regional Officer, CECB, Bilaspur, Chhattisgarh.

M/s KSK Mahanadi Power Company Limited. ***(6x600MW Coal Based Thermal Power Plant)*** ***(3X600MW-Operational)***

At Village-Nariyara, Akaltara, District- Janjgir, Champa, Chhattisgarh.

Six Monthly EC Compliance Report



***For
period:
Apr'24
to
Sep'24***



***Six Monthly Compliance Status for Specific Conditions of
Environmental Clearance Accorded, Amendment and Extended
of Validity vide***

***Ref. Letter No- J13012/44/08 -IA.II (T) Dated 19.10.2009
upto***

Ref. Letter No- J-13012/44/2008-IA.II (T), Dated 19.04.2018

S. No.	Condition	Compliance Status
1	Two tri-flue stacks of 275m height should be provided.	<p>Current status</p> <p>Two nos. of RCC stacks already been provided (includes six flue cans) for all the six units. The height of both the stacks is 275 meters from the ground level. Out of six cans, three are in use and balance cans idle which are part of balance units. Photographs are attached as Annexure-I</p> <p>Condition complied</p>
2	COC of 5 shall be maintained	<p>Current status</p> <p>Cycle of Concentration 5 has been maintained and details are attached as Annexure-II</p> <p>Condition complied and being complied</p>
3	To utilize fly ash generated from the power plant, the proponent should explore the possibility of setting up either its own cement plant /grinding unit and/or a brick manufacturing unit of 50,000/1,00,000 bricks/day capacity, and explore other possibilities of utilizing the fly ash in full form the stipulated period.	<p>Current status</p> <p>A 20,000 brick capacity brick manufacturing facility has been installed and operation and apart from that supplying fly ash to brick manufacturers around 10 km radius and details are attached as Annexure-III</p> <p>Achieved 100% fly ash utilization As per Fly Ash Notification S.O. 2804(E), 3rd November, 2009 and subsequent amendments thereof and details of data and long term action is enclosed as Annexure-IV.</p> <p>Condition complied and being complied</p>
4	For post project monitoring, the proponent should set up piezometric monitoring station around the ash pond.	<p>Current status</p> <p>4 Nos. of Piezometric wells have been provided around the ash pond area.</p> <p>Images of Piezometers is enclosed as Annexure-V</p> <p>Condition complied and being complied</p>
5	From 4 th year onwards, the transportation of coal should be through rail only.	<p>Current status</p> <p>i) A state of art Railway Infrastructural facilities have been developed to transport coal through rail mode in KMPCL.</p> <p>ii) As per EC amended by MoEF &CC on 19.04.2018; Coal is being transported on the basis of following manner:</p> <p>a) 90% domestic Coal is being transported by Rail mode and 10% by Road.</p>

		<p>b) 100% imported Coal is being transported through Railway mode.</p> <p>Details of infrastructure facilities are presented in Annexure-VI.</p> <p>Condition complied and being complied</p>
6	<p>The green belt to be provided should be of canopy type with three tiers.</p>	<p>Current status</p> <p>A green belt of 5/6 tiers, in 100 meter width is being developed, along the periphery of the plant boundary.</p> <p>Species selection has been made on the basis of local Climatological factors and soil characteristics.</p> <p>(i.e. Sisam, Peltiform, Satvan, Karanj, Siris, Simarua, Neem, Ganga imili, Pepal, Kadam, Cassia Siamia, Chinour, Arjuna, Mango, Bargad, Jamun, Amla, Gulmohar are being used in rows to maintain canopy type and strata)</p> <p>As on date, total 7,20,000 nos. of saplings have been planted within the Plant premises in an areas about 277 hectares i.e 33.3% of total project area (828.46 Hectares). Out of which 6,62,389 nos. of saplings has been survived and further plantation by causality replacement is under progress. Photos of the Greenbelt developed at site are attached as Annexure-VII.</p> <p>Condition complied and being complied</p>
7	<p>An amount of 64 crore as capital and Rs. 10 crore/annum as recurring should be earmarked for the activities to be taken up under CSR by the above proponent. Details of activities to be undertaken in this regard should be submitted.</p>	<p>Current status</p> <p>Amount of Rs.54.04 crore has been spent on CSR activities as capital expenditure, details of expenditure statement along with CSR activities are attached as Annexure-VIII.</p> <p>In accordance with the MoEF&CC guidelines, Rs 1.83 crores per annum has been allocated for CSR recurring costs, out of which Rs. 0.34 crore has been spent by M/s KMPCL on CSR activities in the last six months. An activity report, along with expenditure details, are attached in Annexure-VIII (A).</p> <p>The Report has been submitted to MOEF&CC Office periodically.</p> <p>Condition complied and being complied</p>
8	<p>High efficiency of Electrostatic Precipitator (ESP) with spare fields shall be installed to</p>	<p>Current status</p>

	<p>ensure that particulate emission does not exceed 50 mg/Nm³.</p>	<p>High efficiency ESP + Hybrid Fabric Filter combination, with 99.7% efficiency has installed for each Unit (600MW). Average emission of Particulate Matter from operational Units# 3, 4 & 2 are well within stipulated norms of 50mg/Nm3 and 30 mg/Nm3.</p> <p>Note:</p> <p>Emissions from Unit#3 and Unit#4 have been designed to operate less than 50 mg/Nm3 and in case of Unit#2, it is less than 30mg/Nm3.</p> <p>Average particulate matter emissions from operating Units- 3, 4 and 2 over the last six months are shown below:</p> <table><tr><th colspan="4">Particulate Matter Emission's Result (mg/Nm3)</th></tr><tr><th rowspan="2">Six months average</th><th>Unit # 3 (600 MW)</th><th>Unit # 4 (600 MW)</th><th>Unit # 2 (600 MW)</th></tr><tr><td>7.1</td><td>12.8</td><td>25.7</td></tr></table> <p>The details of ESP photographs and stack emission monitoring results for the last six months are presented in Annexure-IX.</p> <p>Condition complied and being complied.</p>	Particulate Matter Emission's Result (mg/Nm3)				Six months average	Unit # 3 (600 MW)	Unit # 4 (600 MW)	Unit # 2 (600 MW)	7.1	12.8	25.7
Particulate Matter Emission's Result (mg/Nm3)													
Six months average	Unit # 3 (600 MW)	Unit # 4 (600 MW)	Unit # 2 (600 MW)										
	7.1	12.8	25.7										
9	<p>Space provision shall be kept for retrofitting of FGD system, if required at a later date.</p>	<p>Current status</p> <p>Space provisions have been made for installation of FGD system in Project lay out. Details are attached in Annexure-X.</p> <p>Condition complied and being complied</p>											
10	<p>Adequate dust extraction such as cyclones/bag filters and water spray system in dusty areas such as in coal handling and ash handling points, transfer areas and other vulnerable dusty areas shall be provided.</p>	<p>Current status</p> <p>Following provisions have been made to control the Fugitive emissions:</p> <ul style="list-style-type: none">➤ Pulse Jet type bag filters have been installed at all the Transfer points and on coal conveyor system meant for Coal transport from CHP area to boiler area.➤ 44 Nos. of Rain guns with Water spraying system has been installed in the Coal yard area.➤ 172 Nos. Dust Suppression System & 28 Nos. Dry Fog System has been working in different raw material transfer points and handling section to control fugitive emission at CHP area.											

		<p>Fly ash silo top is mounted with 2 Nos. of Bag filters to arrest fugitive dust, similarly</p> <p>Water spraying system has been provided to mitigate fugitive dust from the dust prone area. Details of Dust extraction and dust suppression systems are attached in Annexure-XI</p> <p>Condition complied and being complied</p>
11	A Sewage treatment plant shall be provided and the treated sewage shall be used for raising greenbelt/plantation.	<p>Current status</p> <p>STP having capacity of 2x25m³/Hr., is under operation, for treating Domestic waste water.</p> <p>The treated waste water is being reused for green belt and horticulture purpose. Photographs are attached in Annexure-XII.</p> <p>Condition complied and being complied</p>
12	Rainwater harvesting should be adopted. Central Ground Water Authority/board is consulted for finalization of appropriate rain water harvesting technology within a period of three months from the date of clearance and details shall be furnished.	<p>Current status</p> <ul style="list-style-type: none"> ➤ Rain water harvesting structures have been constructed as per approved plan of CGWB. ➤ Rain water harvesting pond has been constructed within premises, abandoned bore wells have been converted into rain water recharge wells and Percolation structures have been constructed in low lying areas. Details of completed rainwater structures are presented as Annexure-XIII. <p>Condition complied and being complied</p>
13	Adequate safety measures shall be provided in the plant area to check/minimize spontaneous fires in coal yard, especially during summer season.	<p>Current status</p> <p>Adequate provision for dust suppression system-water sprinkling arrangement has been incorporated in the project in all dust vulnerable areas including coal storage yard and being operated regularly to minimize fugitive emissions. All safety measures have been adopted to check/minimize any incidents of fire and especially in summer season. Two full-fledged fire tenders are available at site. Photos are attached in Annexure-XIV.</p> <p>Condition complied and being complied</p>
14	Storage facilities for auxiliary liquid fuel such as LDO/HFO/LSHS shall be made in the plant area where risk is minimum to the storage facilities. Disaster Management Plan shall be prepared to meet any eventuality in case of	<p>Current status</p> <p>Based on the QRA, safe location has been identified for auxiliary fuels and the same has been located in</p>

	<p>an accident taking place. Sulphur content in the liquid fuel not exceed 0.5%</p>	<p>the North-West corner at a distance of 600 mts from the nearest plant facility.</p> <p>On Site Disaster Management Plan has been approved by factory Inspector and the same is being implemented during operation of the power plant and attached as Annexure-XV.</p> <p>Condition complied and being complied</p>										
16	<p>Regular monitoring of ground water in and around ash pond area including heavy metals (Hg,Cr,As,Pb) shall be carried out, records maintained and six monthly reports shall be furnished to the Regional Office of this Ministry.</p> <p>The data so obtained should be compared with the baseline data so as to ensure that the ground water quality is not adversely affected due to the project.</p>	<p>Current status</p> <p>Regular Monitoring of ground water in and around ash dyke areas is being carried out to check the heavy metals in the ground water.</p> <p>The concentration of Hg, Cr, As, Pb in groundwater is compared with the baseline concentration, which is within the normal range. Analysis of the last six months shows that all IS:10500-compliant parameters are well within the specified limits.</p> <table><tr><td>Six months Avg. data</td><td>Hg (mg/l)</td><td>Cr (mg/l)</td><td>As (mg/l)</td><td>Pb (mg/l)</td></tr><tr><td></td><td><0.001</td><td><0.05</td><td><0.01</td><td><0.01</td></tr></table> <p>The details of monitoring reports for the last six months are attached in Annexure-IX.</p> <p>Condition complied and being complied</p>	Six months Avg. data	Hg (mg/l)	Cr (mg/l)	As (mg/l)	Pb (mg/l)		<0.001	<0.05	<0.01	<0.01
Six months Avg. data	Hg (mg/l)	Cr (mg/l)	As (mg/l)	Pb (mg/l)								
	<0.001	<0.05	<0.01	<0.01								
17	<p>A greenbelt of adequate width and density shall be developed around the plant periphery covering 1/3rd of the project area with local species.</p>	<p>Current status</p> <p>A green belt of 5/6 tiers, in 100 meter width is being developed, along the periphery of the plant boundary.</p> <p>Species selection has been made on the basis of local Climatological factors and soil characteristics.</p> <p>(i.e. Sisam, Peltophorum, Chatian, Karanj, Siris, Simarua, Neem, Arjun, Ganga emali, Pipal, Kadam, Cassia siamia, Chinour, Kahua, Mango, Bargad, Jamun, Amla, Gulmohar are being used in rows to maintain canopy type strata)</p> <p>As on date, total 7,20,000 nos. of saplings have been planted within the Plant premises in an areas about 277 hectares i.e 33.3% of total project area (828.46 Hectares). Out of which 6,62,389 nos. nos. of saplings has been survived and further plantation by causality replacement is under progress. Photos of the Greenbelt developed at site are attached as Annexure-VII.</p>										

		Complied and being complied
18	First Aid and sanitation arrangements shall be made available for the drivers and other contract workers during construction phase.	<p>Current status</p> <p>Adequate arrangement for first aid, sanitation and safe drinking water has been provided for all drivers and contractor workers during construction activities.</p> <p>Complied and being complied</p>
19	Regular monitoring of ground level concentration of SO ₂ , NO _x , Hg, SPM and RSPM shall be carried out in the impact zone and records maintained. If at any stage these levels are found to exceed the prescribed limits, necessary control measures shall be provided immediately. The location of the monitoring stations and frequency of monitoring shall be decided in consultation with SPCB. Periodic reports shall be submitted to the Regional Office of this Ministry. The data shall also be put on the website of the company.	<p>Current status</p> <p>Regular ambient air quality monitoring of ground level concentration of SO₂, NO_x, CO, PM₁₀ and PM_{2.5} is being carried out in the impact zone and the details are being submitted on monthly basis to CECB, Chhattisgarh. The values are well within the prescribed limits.</p> <p>Observations of last six months presented below:</p> <p><u>Inside the plant premises:</u></p> <p><u>PM_{2.5}</u>: The maximum value for PM_{2.5} observed at AHP area as 49.7 µg /m³ and minimum value at DM plant area as 30.5 µg/m³. The 24 hours applicable limit inside the plant premises 60 µg /m³ for industrial area.</p> <p><u>PM₁₀</u>: The maximum value for PM₁₀ observed at AHP area as 78.9 µg /m³ and minimum value at DM plant area as 51.3 µg/m³. The 24 hours applicable limit inside the plant premises 100 µg /m³ for industrial area.</p> <p><u>SO₂</u>: The maximum value for SO₂ observed at AHP area as 18.5 µg /m³ and minimum value at DM plant area as 11.2 µg /m³. The 24 hours applicable limit inside the plant premises 80 µg /m³ for industrial area.</p> <p><u>NO_x</u>: The maximum value for NO_x observed at AHP area as 20.7 µg /m³ and minimum value at DM plant area as 12.6 µg/m³. The 24 hours applicable limit inside the plant premises 80 µg /m³ for industrial area.</p> <p><u>CO</u>: The maximum value for CO observed at AHP area as 0.350 mg/m³ and minimum value at BTG plant area as 0.205 mg/m³. The 8 hours applicable limit inside the plant premises 02 mg/m³ for industrial area.</p> <p><u>Outside of the plant premises:</u></p> <p><u>PM_{2.5}</u>: The maximum value for PM_{2.5} observed at Amora village as 36.7 µg /m³ and minimum value</p>

		<p>at Nariyara village as 25.2 µg /m³. The 24 hours applicable limit outside the plant premises 60 µg/m³for Rural/Residential area.</p> <p><u>PM10</u>: The maximum value for PM10 observed at Amora village as 65.3 µg /m³ and minimum value at Sonsari village as a 47.3 µg /m³. The 24 hours applicable limit outside the plant premises 100 µg /m³ for Rural/Residential area.</p> <p><u>SO₂</u>: The maximum value for SO₂ observed at Taroud village as 13.8 µg /m³ and minimum value at Amora village as 8.5 µg /m³. The 24 hours applicable limit outside the Plant premises 80 µg /m³ for Rural/Residential area.</p> <p><u>NO_x</u>: The maximum value for NO_x observed at Taroud village as 16.1 µg /m³ and minimum value at Amora village as 11.2 µg /m³. The 24 hours applicable limit outside the plant premises 80 µg /m³ for Rural/Residential area.</p> <p><u>CO</u>: The maximum value for CO observed at Taroud village as 0.2229 mg/m³ and minimum value for CO at Sonsari village as 0.114 mg/m³. The 8 hours applicable limit outside the plant premises 02 mg/m³ for Rural/Residential area.</p> <p>Details of six months monitoring report is attached as Annexure-IX.</p> <p>Complied and being complied</p>
20	<p>The project proponent shall advertise in at least two local newspapers widely circulated in the region around the project, one of which shall be in the vernacular language of the locality /office of Municipal Corporation/Gram Panchayat concerned and on the company's web site within seven days from the date of this clearance letter, informing that the project has been accorded environmental clearance and copies of clearance letter are available with the State Pollution Control Board/Committee and may also be seen at Website of the Ministry of Environment and Forests at http://envfor.nic.in.</p>	<p>The Public Notice of Environmental Clearance has been published in two local newspapers namely- The Haribhumi and DanikBhaskar on 23.10.09 which are widely circulated in the region. Enclosed as Annexure -XVI.</p> <p>Complied</p>
21	<p>A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parisad / Municipal Corporation, urban local Body and the Local NGO, if any, from</p>	<p>Current status</p> <p>Environmental Clearance letter has been placed in the website of the company.</p>

	whom suggestions/representations, if any, received while processing the proposal. The clearance letter shall also be put on the website of the Company by the proponent.	Complied and being complied
22	The proponent shall upload the status of compliance of the stipulated EC conditions, including results of monitoring data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of MoEF, the respective Zonal office of CPCB and the SPCB. The criteria pollutant levels namely; SPM, RSPM, SO ₂ , NO _x (ambient levels as well as stack emissions) shall be monitored and displayed at a convenient location near the main gate of the company in the public domain.	<p>Current status</p> <p>Status of compliance of EC conditions has been uploaded as stipulated and is being updated regularly on Six monthly basis.</p> <p>Complied and being complied</p>
23	The project proponent shall also submit six monthly reports on the status of compliance of the stipulated EC conditions including results of monitored data (both in hard copies as well by e-mail) to the respective Regional Office of MOEF&CC, the respective Zonal Office of CPCB and the SPCB.	<p>Current status</p> <p>Half-yearly report for the period of Oct'23 to Mar'24 has been submitted vide KMPCL Letter No. MoEF&CC, RPUR/BPSN/2500108/493, Dtd. 01.06.2024. Enclosed as Annexure-XVII</p> <p>Condition complied and being complied</p>
24	The environment statement for each financial year ending 31 st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of EC conditions and shall also be sent to the respective Regional Offices of MOEF by e-mail.	<p>Current status</p> <p>Environment Statement for the Financial year 2023-24 has been submitted vide KMPCL letter no. - CECB, BILAS/BPSN/2500108/732 Date: 10.09.2024. Last financial year environment statements is attached as Annexure-XVIII.</p> <p>Condition Complied and being complied</p>
25	A separate environment management cell with qualified staff shall be set up for implementation of the stipulated environmental safeguards.	<p>Current status</p> <p>An Environment Management cell has been setup, headed by Sr. Deputy General Manager. Organogram of Sr. Environment Management cell is attached as Annexure-XIX.</p> <p>Condition complied and being complied</p>

26	Regional Office of the Ministry of Environment & Forests located at Bhopal will monitor the implementation of the stipulated conditions. A complete set of documents including Environmental Impact Assessment Report, Environment Management Plan along with the additional information submitted from time to time shall be forwarded to the Regional Office for their use during monitoring.	<p>Current status</p> <p>A complete set of documents has been submitted to Regional Office of the Ministry vide Letter Ref No. MOE&F, BHPL/AGRY/1160201/1147 Dated 09.12.2009.</p> <p>Condition complied and being complied</p>
27	Separate funds shall be allocated for implementation of environmental protection measures along with item-wise break-up. These cost shall be included as part of the project cost. The funds earmarked for the environment protection measures shall not be diverted for other purposes and year-wise expenditure should be reported to the Ministry.	<p>Current status</p> <p>As submitted in the EIA report separate amount of Rs. 1246 Cr. has been provided for pollution control, treatment and monitoring systems.</p> <p>Condition complied and being complied</p>
28	The project authorities shall inform the Regional Office as well as the Ministry regarding the date of financial closure and final approval of the project by the concerned authorities and the dates of start of land development work and commissioning of plant.	<ul style="list-style-type: none"> • Date of financial closure: Feb, 2010. • Date of start of land development work Nov, 2009. • Unit No.# 3 (1x600MW) is under operation since Sep 2013 • Unit No.# 4 (1x600MW) is under operation since Sep 2014 • Unit No.# 2 (1x600MW) is under operation since Feb 2018 • Work was in stopped due to financial constraints and work shall be commenced after obtaining EC for balance units. <p>Details are presented as Annexure-XX.</p> <p>Condition complied and being complied</p>
29	Full cooperation shall be extended to the Scientists/Officers from the Ministry/Regional Office of the Ministry at Bangalore/the CPCB/the SPCB who would be monitoring the compliance of Environmental status.	<p>Noted & agreed.</p> <p>Being complied as per the requirements of CPCB and CECB Raipur, Chhattisgarh.</p>

	J-13012/44/2008-IA(T) Government of India, Ministry of Environment & Forests, dated 24.01.2012	
30	The project proponent shall upload the status of compliance of the conditions stipulated in the environmental clearance issued vide this Ministry's letter even no.19.10.2009, in its website and updated periodically. The same shall also be simultaneously send by email to concerned Regional office of the Ministry of Environment and Forests	<p>Current status</p> <p>Condition complied and being complied</p>
31	Criteria pollutant level including Nox, RSPM (PM10,PM2.5) Sox (from stack & ambient) shall be regularly monitored and results displayed in your website and also at the main gate of the power plant	<p>Current status</p> <p>Erected display board at Main gate area and also displayed in website and details are presented as Annexure-XXI.</p> <p>Condition complied and being complied</p>
	J-13012/44/2008-IA.II (T) Government of India, Ministry of Environment, Forests, and Climate change dated 23.09.2015-Additional conditions as per EC Amended & Extended of Validity on 23.09.2015	
32	The total project area shall comprise of 828.46 Ha as stipulated while issuing the EC	<p>Current status</p> <p>Details are as follows:</p> <p>Main Plant area: 348.82</p> <p>Ash dyke area: 167</p> <p>Greenbelt area:277.00</p> <p>Colony area: 38.64</p> <p>Total : 828.46 Ha</p> <p>Details are presented as Annexure-XXII</p> <p>Condition complied and being complied</p>
33	An amount of Rs 64 crores as capital and Rs 1.83 Crores /annum (or the amount as per the CSR policy of GOI whichever is higher) as recurring costs should be earmarked for CSR activities to be undertaken in this regard shall be submitted.	<p>Current status</p> <p>Amount of Rs.54.04 crore has been spent on CSR activities as capital expenditure, details of expenditure statement along with CSR activities are attached as Annexure-VIII.</p> <p>In accordance with the MoEF&CC guidelines, Rs 1.83 crores per annum has been allocated for CSR recurring costs, out of which Rs. 0.34 crore spent by M/s KMPCL on CSR activities in the last six months.</p>

		<p>An activity report, along with expenditure details, are attached in Annexure-VIII (A).</p> <p>The Report has been submitted to MOEF&CC Office periodically.</p> <p>Condition complied and being complied</p>
34	<p>Continuous online monitoring system for stack emissions, ambient air quality and effluent discharge for various relevant parameters shall be put in place at the earliest, if already done and compliance to be reported to this ministry including its RO</p>	<p>Current status</p> <p>Continuous online monitoring system for stack emissions is already installed & working w.r.t operational Units No. # 3, 4 & 2.</p> <p>Online monitoring data is already showing at main gate display board and website-portal of KMPCL.</p> <p>Four CAAQMS have been installed inside the plant premises.</p> <p>Continuous Effluent Monitoring systems have been installed in Guard Pond.</p> <p>The Real time data for CEMS, CEQMS & CAAQMS have also been transmitted to CPCB server through G-lens software.</p> <p>Photos for the same are attached as Annexure-XXIII.</p> <p>Condition complied and being complied</p>
35	<p>Harnessing solar power within the premises of the plant shall be carried out and the status of implementation including actual generation of solar power shall be submitted along with half yearly monitoring report.</p>	<p>Current status</p> <p>Feasibility studies have been carried internally and estimated area to generate solar power from rooftop 90,000sqm, which will generate 4.0, MW Total cost per MW of Rs. 3.0 Crores and which costs of Rs.9.00 Crores.</p> <p>Total available rooftop area is 90,000 sqm and out of the area could consider for installation of rooftop solar power system (40,000 sqm).</p> <p>Initially planning to spend on rooftop solar system is Rs. 25.00 Lakhs during current financial year.</p> <p>Condition complied and being complied</p>
36	<p>A long term study of radio activity and heavy metals contents on coal to be used shall be carried out through reputed institute and results thereof analyzed every two year and reported along with monitoring reports. Therefore mechanism for an in built continuous monitoring for radio activity and</p>	<p>Current status</p> <p>Long term study of radio will be carried out through reputed institute. In this connection, we are in discussion with National Geophysical Research Institute, Hyderabad to finalise detailed scope of work to be carried out and planning to initiate activity by end of end year.</p>

	heavy metals in coal and fly ash (including bottom ash) shall be put in place.	<p>However, the following measures have been taken to minimize the leaching if any in coal yard and ash storage systems</p> <ol style="list-style-type: none"> 1. 300mm CC Flooring has been done in Coal yard area. 2. Construction of garland drain, all along the Coal yard, from where waste water is collected and after treatment in ETP, the water is being reused for dust suppression <p>Following measures has been implemented for Ash Dyke area, to check the leaching of Heavy metals into the ground water table :</p> <ol style="list-style-type: none"> 1. Both Bottom & Fly ash Dykes has been floored with 0.75Micron LDPE. 2. Four No's of piezo metric Wells have been constructed, along the periphery of ash Dykes, for regular monitoring of Quantity & Quality of ground water to assess the contamination or leaching of heavy metals from ash dyke area and details are attached in Annexure-IX. <p>Condition complied and being complied</p>
37	Mercury emissions from stack shall be monitored on periodic basis.	<p>Current status</p> <p>Stack Emissions monitoring is being done monthly intervals for SO₂, NO_x, CO, PM & Hg and other heavy metals. Reports for the same are being submitting to SPCB on monthly basis. The average result for mercury over the last six months was 0.010 mg/Nm³. Details are attached as Annexure-IX.</p> <p>Condition complied and being complied</p>
38	Fugitive emissions shall be controlled to prevent impact on agricultural or non-agricultural land.	<p>Current status</p> <p>Following provisions have been made to control the Fugitive emissions:</p> <ul style="list-style-type: none"> ➤ Pulse Jet type bag filters have been installed at all the Transfer points meant for Coal transport from CHP area to boiler area. ➤ 44 Nos. of Rain guns with Water spraying system has been installed in the Coal yard area. ➤ 172 Nos. Dust Suppression System & 28 Nos. Dry Fog System has been working at different raw material transfer points and handling section to control fugitive emission in CHP area.

		<p>Fly ash silo top is mounted with 2 Nos. of Bag filters to arrest fugitive dust, similarly</p> <p>Water spraying system has been provided to mitigate fugitive dust from the dust prone area.</p> <p>Apart from that a thick green belt is already developed around plant boundary to arrest fugitive emission from non-point sources. Photos are attached as Annexure-XXIV.</p> <p>Condition complied and being complied</p>
39	No water bodies including natural drainage system in the area shall be disturbed due to activities associated with the setting up/operation of the power plant.	<p>Current status</p> <p>Adequate measures had been implemented to take care of natural drainage system.</p> <p>Condition complied and being complied</p>
40	Fly ash shall not be used for agricultural purpose. No Mine void filling will be undertaken as an option for ash utilization without adequate lining of mine with suitable media such as that no leachate shall take place at any point of time. In case, the option of mine void filling is to be adopted, prior detailed study of soil characteristics of the mine area shall be undertaken from an institute of repute and adequate clay lining shall be ascertained by the state pollution control board.	<p>Complied and being complied</p>
41	Details of 100% Fly ash utilization plan as per latest Fly ash Notification of GOI along with firm agreements/ MOU with contracting parties including other usages etc. shall be submitted. The plan shall also include disposal method/ mechanism of bottom ash.	<p>Current status</p> <p>Achieved 100% fly ash utilization As per Fly Ash Notification S.O. 2804(E), 3rd November, 2009. Annual Fly Ash Compliance report for FY 2023-24 has been submitted to CPCB is attached as Annexure-XXV.</p> <p>Condition complied and being complied</p>
42	Green belt shall also be developed around the ash pond and above the green belt around the plant boundary.	<p>Current status</p> <p>For green belt, more than 30000 saplings have been planted all around the ash dyke area, covering area of approx. 25 Ha.</p> <p>A green belt of 5/6 tiers, in 100 mtr width is being developed, along with the periphery of the plant boundary.</p>

		<p>Species selection has been made on the basis of local Climatological factors and soil characteristics.</p> <p>(i.e. Sisam, Peltiform, Satvan, Karanj, Siris, Simarua, Neem, Ganga emili, Pepal, Kadam, KesiaSamia, Chinour, Arjuna, Mango, Bargad, Jamun, Amla, Gulmohar are being used in rows to maintain canopy type and strata)</p> <p>As on date, total 7,20,000 nos. of saplings have been planted within the Plant premises in an areas about 277 hectares i.e 33.3% of total project area (828.46 Hectares). Out of which 6,33,185 nos. of saplings has been survived and further plantation by causality replacement is under progress. Photos of the Greenbelt developed at site are attached as Annexure-VII. Plant layout along with greenbelt plant is presented as Annexure-XXVI.</p> <p>Condition complied and being complied</p>
43	<p>An environment Cell comprising of at least one expert in environment science/Engg. Ecology, occupational health and social science, shall be created preferably at project site itself and shall be headed by an officer of appropriate superiority and qualification. It shall be ensured that the head of the cell shall directly report to the Head of the plant who would be accountable for implementation of environmental regulations and social impact improvement/mitigation measures.</p>	<p>Current status</p> <p>Environment Cell is already established which includes Environment Engineer, Environmental scientist, Ecologist, Horticulturist and social science experts from inception of project operations. Environmental cell head is directly reporting to plant. EMD cell basic responsibility is to implement environmental compliance conditions of MOEFCC and CFE and CFO and also implement environmental measures.</p> <p>Condition complied and being complied</p>
44	<p>CSR schemes identified based on public hearing issues and need based assessment shall be implemented in consultation with the village panchayat and the district administration starting for the development of project itself. AS part of CSR prior identification of local employable youth and eventual employment in the project after imparting relevant training shall be also undertaken. Company shall provide separate budget for community development activities and income generating programs.</p>	<p>Current status</p> <p>CSR schemes already identified based on public hearing issues and need based assessment & implemented in consultation with the 4-village panchayat and the district administration. Also Company already provided separate budget for community development activities.</p> <p>Condition complied and being complied</p>
45	<p>For proper and periodic monitoring of CSR activities, a CSR Committee or a social audit</p>	<p>Current status</p>

	<p>committee or suitable credible external agency shall be appointed.</p> <p>CSR activities shall also be evaluated by an independent external agency. This evaluation shall be both concurrent and final</p>	<p>Regular monitoring of CSR activities is being done by Plant authorities and also appraised to District administration.</p> <p>Condition complied and being complied</p>
46	<p>The project proponent shall formulate a well laid corporate environment policy and identify and designate responsible officers at all levels of its hierarchy for ensuring adherence to the policy and compliance with the conditions stipulated in this clearance letter and other applicable environmental laws and regulations.</p>	<p>Current status</p> <p>Corporate Environmental policy has been prepared as per laws and regulations. At present the environmental affairs has been evaluated by the environmental cell headed by Environmental Officer.</p> <p>Corporate Environment Policy is attached as Annexure-XXVII.</p> <p>Condition complied and being complied</p>
	<p><i>J-13012/44/2008-IA.II (T) Government of India, Ministry of Environment, Forests, and Climate change dated 26.05.2016-EC amendment for source of coal</i></p>	
47	<p>The Sulphur and ash content coal shall not exceed 0.6% and 36% as per EC. For imported coal, the same shall not exceed 0.8% and 25% respectively or as per the MoU/FSA, whichever is lower.</p>	<p>Current status</p> <p>Complied for both Sulphur and Ash contents. Average Sulphur and Ash content of coal has been used in KMPCL are 0.4% and 36% respectively. Details are attached in Annexure-XXVIII.</p> <p>Condition complied and being complied</p>
48	<p>Imported coal transport shall be by rail only</p>	<p>Current status</p> <p>100% imported coal has been transported through rail mode.</p> <p>Condition complied and being complied</p>
49	<p>Necessary action shall be taken for compliance of the Operating & Proposed Units to the standards for TPPs notified on 07.12.2015.</p>	<p>Current status</p> <p>For Particulate Matter emission and specific water consumption for all operational Units has been achieved within in the prescribed standard.</p> <p>To achieve SO₂ and NO_x limits, the FGD installation is as designed and planned. As per the notification of MoEF&CC, dated 5th Sep 2022, the completion project is to be completed by 31 December 2026.</p> <p>In this connection, Technical Bids evaluation is under progress and details are presented in Annexure-XXIX.</p> <p>Condition complied and being complied</p>

50	The matter regarding rail transportation of coal shall be taken up with the Railways and other concerned authorities immediately so that EC condition regarding 100% rail transportation from 4 th year or before can be duly complied	<p>Current status</p> <p>Complied and in this connection, approached MOEFCC and obtained approval for transportation coal through rail and road mode</p> <p>Condition complied and being complied</p>
<i>J-13012/44/2008-IA.II (T) Government of India, Ministry of Environment, Forests, and Climate change dated 19.04.2018-Amendment in EC and validity extension of EC Additional conditions</i>		
51	As forward e-auction is a participation and shall not guarantee the PP to confirm coal sourcing, therefore, on confirmation of sourcing of e-auction of coal blocks/ basket of coal mines, the PP shall inform the details of coal procurement and shall limit the coal transportation by road for 3.54 MTPA (50% of linkages) domestic coal procured.	<p>Current status</p> <p>Noted and committed to comply condition and details of coal sourcing are attached as Annexure-XXX.</p> <p>Condition complied and being complied</p>
52	The remaining quantity of 8.02 MTPA domestic coal and 2.6 MTPA imported coal shall be transported by rail only. A fresh reference shall be made to the Ministry for any change in mode of transport.	<p>Current status</p> <p>Noted and will be informed to MOEFCC if any change in mode of transport accordingly</p> <p>Condition complied and being complied</p>
53	The balance of the CSR activities to be taken up on the remaining funds as proposed in six villages whose land has been acquired for railway line is to be implemented. The details of activities along with expenditure shall be submitted to Regional officer of the Ministry along with six monthly compliance report	<p>Current status</p> <p>Details of CSR activities and incurred expenditure in six villages are presented as Annexure-XXXI.</p> <p>Condition complied and being complied</p>
54	Estimated peak traffic in terms of PCU as compared with stipulated standards by IRC for traffic capacity of the existing road network is adequate. Further, as forward E-auction mode procurement has been initiated by Ministry of Coal to overcome coal shortages of various thermal power plants in light of loss of coal block/coal linkages, participation in the forward E auctioned as procurement from coal linkage is allowed	<p>Current status</p> <p>Condition complied and being complied</p>
55	As ghatmundra village located toward Gevra, Dipka,Kusumunda and Manikpur mines is found to be relatively more stressed	<p>Current status</p>

	due to truck movement, necessary control measures be taken in this location to reduce air pollution and noise levels	Regular water sprinkling mechanism has been developed in sensitive areas like school zones and village populated to arrest fugitive emission due to movement of trucks plying from coal mine to power plant and details are presented as Annexure-XXXII Condition complied and being complied
56	Once the E-auction is firmed up, road routes with distribution to total quantity of coal along with number of trucks to be plied on various routes shall be provided. A copy of linkage documents shall also be submitted to the Ministry	Current status Details of e auction coal procurement, road route are presented as Annexure-XXXIII. Condition complied and being complied
<i>Additional conditions as per Office Memorandum on Amendment in Environmental clearance for change in coal source by Thermal Power Plants, Dtd.28.08.2019</i>		
57	The guidelines prepared by CPCB of disposal of fly ash for reclamation of low lying areas and in stowing/backfilling of abandoned mines/quarries shall be followed during disposal of ash in abandoned or working mines	Current status Fly ash is being used in reclamation of low-lying area, abandoned stone quarry pits in and around power plant area and detailed list of stone quarry pits are attached as Annexure-XXXIV. Condition complied and being complied
58	There should be at least be clearance of 500 m of safe distance be maintained from river and water body in ash disposal in abandoned mines to prevent embankment failures and fly ash flowing into the nearby water body	Current status Noted and adhered strictly to avoid free flow fly ash flowing into the nearby water bodies Condition complied and being complied
59	The top layer of the fly ash disposal area in the abandoned mines shall kept moist during disposal	Current status Photographs are attached as Annexure-XXXV. Condition complied and being complied
60	Top layer of the disposal area should have 70 cm overburden or gravel /stones and then 30 cm of sweet soil cover. Subsequently, vegetation shall be raised on the soil cover	Current status Committed to comply condition and details are attached as Annexure-XXXVI. Condition complied and being complied
61	Bioaccumulation and bio-magnification tests shall be conducted on surrounding flora and fauna (tree leaves, vegetation, crop yields and cattle population) during pre-monsoon and post monsoon season to find out any trace metal escaped through ground water or runoff.	Current status Bio-accumulation and bio magnification studies are planned to carryout in post season or winter season in working and abandoned stone quarry pits around power plant area will be planning to carry out in winter season and same will be submitted to MOEFCC

		In process of compliance of condition
62	Surface runoff and supernatant water, any case shall not be let into the surrounding areas. It shall be collected by providing adequate drains around the mine. The supernatant water along with surface runoff shall be treated and re used for mixing ash and plant operations	<p>Current status</p> <p>Committed to adhere the condition and as on today, bottom ash supernatant waste water is being extracted through Ash water recovery system and reused in ash handling. Details are attached as Annexure-XXXVII.</p> <p>Compliance condition complied and being complied</p>
63	To the extent possible, only decanted water from mine, make up water from treated effluents such cooling tower blow down and treated sewage water shall be used for making ash slurry	<p>Current status</p> <p>Bottom ash supernatant waste water is being extracted through Ash water recovery system and reused in ash handling. Details are attached as Annexure-XXXVII.</p> <p>Condition complied and being complied</p>
64	Fly ash to be used ash soil conditioner in agriculture needs and to be applied in controlled manner to limit excessive application so as to prevent soil degradation. The optimize proportion of ash to be applied which is to certified by State Agriculture Universities/Colleges based on soil testing	Noted
65	Approval of DGMS shall be obtained before disposing the ash in the mine voids	<p>Current status</p> <p>Details are presented as Annexure-XXXVIII.</p> <p>Condition complied and being complied</p>
66	Technology for conversion of fly ash into coarse granules for stowing in in the under ground mines to be explored	Noted
67	All the power plants should install different silos for dry collection of fly ash	<p>Current status</p> <p>Two fly ash SILOs with a capacity of 3800m3 have been installed and the dry fly ash is collected pneumatically.</p>
68	Records pertaining to details of month wise quantity of fly ash disposed and water consumption along with nature/source of water shall be maintained and submitted to Ministry /Regional office annually	<p>Current status</p> <p>Regularly Monthly fly ash generation and utilization status report is being submitted to Chhattisgarh Environment Conservation Board and quarterly specific water consumption report as per prescribed format to CPCB and details are attached as Annexure-XXXIX.</p>

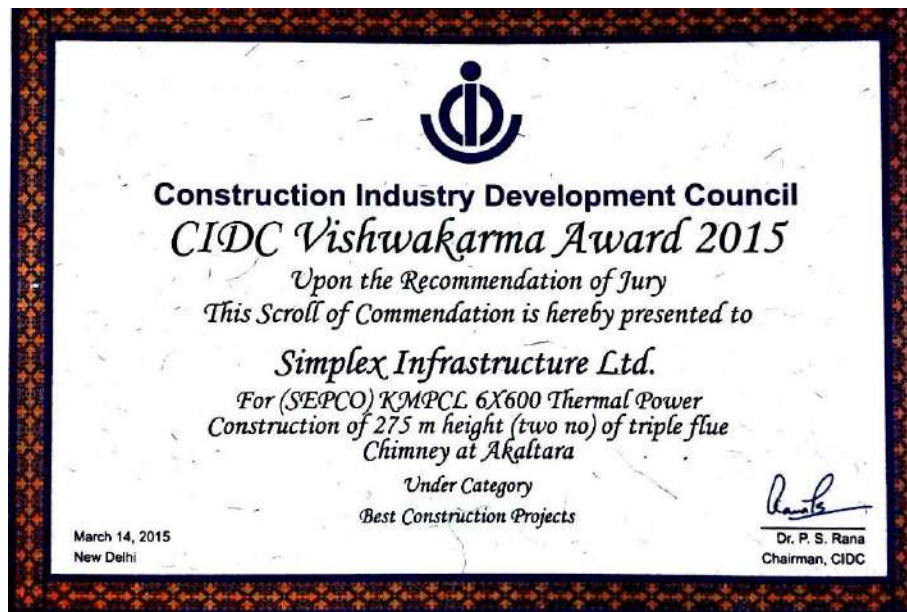
		Condition complied and being complied
69	Before starting the disposal of ash into mine voids, NOC/permission from mine owners is to be obtained in case of mine closure activities not completed or State Government in case of mine has been handed over to the State Government. After its closure. A copy of such NOC/permission is to be submitted to the Ministry and its Regional offices	<p>Current status</p> <p>Details of closure letter from mine owner and land owner are submitted as Annexure-XXXX.</p> <p>Condition complied and being complied</p>
	<i>Additional conditions as per Office Memorandum on Amendment in Environmental clearance for change in coal source by Thermal Power Plants, Dtd.11.11.2020</i>	
70	Details regarding change in source (location of the source, proposed quantity, distance from power plant and mode of transportation), quality (Ash, Sulphur, Moisture content and Calorific value) shall be informed to the Ministry and its concerned Regional Office. The quantity of coal transported from each source along with the mode of transportation shall be submitted as part of EC Compliance Report.	<p>Noted & complying.</p> <p>The details of coal source, mode of transport, distance from power plant and quality of coal i.e. Ash, Sulphur, Moisture content and Calorific value in last six months Apr'24 to Sep'24 are presented as Annexure-XXVIII.</p> <p>Condition complied and being complied</p>
71	The applicable flue gas emissions standards for Particulate Matter, Sulphur Dioxide, Oxides of Nitrogen and Mercury shall be complied in line with Ministry's Notification vide S.O. 3305(E) dated 7.12.2015 and subsequent emissions. A Progress of implementation and its compliance shall be submitted as part of Compliance report.	<p>Noted & complying.</p> <p>The PM & Hg value of flue gas for all running units has been maintained within standard in line with MoEF&CC notification vide S.O. 3305 Dtd. 07.12.2015.</p> <p>To achieve SO₂ and NO_x limits, the FGD installation is as designed and planned. As per the notification of MoEF&CC, dated 5th Sep 2022, the completion project is to be completed by 31 December 2026 and details are presented Annexure-XXIX and approval on Technology and financials from Central Electricity Authority is presented in XXXXI.</p> <p>Condition complied and being complied</p>
72	Ash content in the Coal and Coal transportation is governed by the Ministry's Notification vide S.O. 1561(E) dated 21.5.2020 As far as possible, Coal transportation shall be done by rail/conveyor or other eco- friendly modes. However, road transportation is allowed with tarpaulin covered trucks till the railway/	<p>Current status</p> <p>Noted & complying.</p> <p>i) A state of art Railway Infrastructural facilities have been developed to transport coal through rail mode in KMPCL.</p>

	conveyor belt infrastructure is made available. A progress (Physical and financial) of rail connectivity from nearest railway siding or conveyor connectivity to the power plant shall be submitted in the EC compliance report.	<p>ii) As per EC amended by MoEF &CC on 19.04.2018; Coal is being transported on the basis of following manner:</p> <p>c) 90% domestic Coal is being transported by Rail mode and 10% by Road.</p> <p>d) 100% imported Coal is being transported through Railway mode.</p> <p>Details of infrastructure facilities are presented in Annexure-VI.</p> <p>Condition complied and being complied</p>
73	Additional ash pond is not allowed due to increase in ash content in the raw coal as against the ash pond permitted in the Environmental clearance. The 100% fly ash utilization is to be achieved within 4 years in line with Fly ash Notifications dated 14.9.1999, 27.8.2003, 3.11.2009 and 25.1.2016 and amended time to time or extant regulations on fly ash utilization.	<p>Current status</p> <p>According to Fly Ash notification and as amended time to time on Fly Ash utilization, KMPCL Fly Ash has been utilized 100% in each of the operating units.</p> <p>Condition complied and being complied</p>
74	In case of exceptional circumstances, project proponents may approach the Ministry for seeking permission to use an emergency ash pond with cogent reasons, if any	<p>Current status</p> <p>Noted & Agreed.</p> <p>Complied and being complied</p>
75	The details regarding monthly generation, utilization and disposal of fly ash (including Bottom ash) shall be submitted to the Ministry and its Regional Office.	<p>Current status</p> <p>The details of Fly Ash Generation and utilization have been submitted to the Ministry & its Regional Office. Last FY 2023-24 Fly ash generation & utilization data is presented as Annexure-XXV.</p> <p>Complied and being complied</p>

ANNEXURE - I



Best construction award-KMPCL



SIX FLUE CANS IN TWO CHIMNEYS (THREE FLUE CANS-1,2,3)



SIX FLUE CANS IN TWO CHIMNEYS(THREE FLUE CANS-4,5,6)



ANNEXURE - II



KSK Mahanadi Power Company Limited- COC data Apr'24 to Sep'24

Sr. No	Months	Water consumption (m3/per month)	Concentration of cycles (COC)
1.	Apr-24	2337363	5.29
2.	May-24	2667340	5.41
3.	Jun-24	2608780	5.27
4.	Juy-24	2148374	5.36
5.	Aug-24	1166355	5.43
6.	Sep-24	1407944	5.38

ANNEXURE - III

Photographs of Fly Ash Brick Manufacturing Unit in KMPCL





Works

Near Nariyara Village,
Akaltara Tehsil,
Janjgir - Champa District,
Chhattisgarh
Tel (Site): 07817-284001

Registered Office

8-2-293/82/A/431/A,
Road No. 22, Jubilee Hills,
Hyderabad - 500033.
Tel: +91-40-23559922-25,
Fax: +91-40-23559930

GSTIN-22AADCK6843M1ZB

Memorandum of Understanding

The Memorandum of Understanding ("MOU") is made and entered into on 30th day of December two thousand and Seventeen at Nariyara, Dist. Janjgir-Champa (C.G.) for supplying of Fly ash ((Pond ash/Bottomash/fly ash) from KMPCL Thermal Power Plant for manufacturing of Fly Ash Based products,

BETWEEN

KSK Mahanadi Power Company Limited, a company registered under Companies Act, 1956 and having its registered office at 8-2-293/82/A/431/A, Road No. 22, Jubilee Hills, Hyderabad – 500033, hereinafter referred to as "KMPCL"(which expression shall unless excluded by or repugnant to the context be deemed to include its successors in interest, legal representatives, administrators and assigns) of the ONE PART.

AND

M/s Astha Fly Ash Bricks a firm registered under DTIC JanjgirChampa and having its registered office near Village Tilai, Janjgir-Champa, hereinafter referred to as M/s Astha Fly Ash Bricks (which expression shall unless excluded by or repugnant to the context be deemed to include its successors in interest, legal representatives, administrators and assigns) of the Second Part.

Whereas KMPCL is operating 2 units of the 6 x 600 MW Coal Based Thermal Power Plant near Nariyara Village, Akaltara Tehsil, JanjgirChampa District, Chhattisgarh ("hereinafter referred to as "KMPCL") which generates power using coal as source of fuel. As the coal is consumed and burned for the purpose of producing power, many residual by products are produced, one of which is "fly ash". The said fly ash so formed as a residual by product has many industrial uses and is also used as a raw material used in the production of Brick Manufacturing, in accordance with law and in compliance of the Environmental obligations and duties, KMPCL needs to dispose of the said fly ash in an environmentally friendly and useful manner.

And whereas M/s Astha Fly Ash Bricks is operating a Ash Brick unit located near Tilai Village, Janjgir-Champa of capacity of 20,000 number of Brick production per day by consuming Fly Ash and other raw material, in accordance with law and in compliance of the Environmental obligations and duties, M/s Astha Fly Ash Bricks needs to utilise fly ash in an environmentally friendly and useful manner.

And whereas M/s Astha Fly Ash Bricks has requested KMPCL to supply 40 MT of Fly ash on daily basis for brick production at their manufacturing unit.



Works

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Akaltara Tehsil,
Janjgir - Champa District,
Chhattisgarh
Tel (Site): 07817-284001

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Road No. 22, Jubilee Hills,
Hyderabad - 500033.
Tel: +91-40-23559922-25,
Fax: +91-40-23559930

And whereas KMPCL has agreed to supply Fly Ash by loading Hywas/Trucks/Tipper of M/s Astha Fly Ash Bricks at Silo point and/or at Ash Pond.

And whereas KMPCL and M/s Astha Fly Ash Bricks are entering into an Memorandum of Understanding for supply of fly ash for Manufacturing of Fly ash bricks/blocks.

And Whereas the parties hereto wish to define and set out the terms and conditions for supplying and utilizing Fly Ash for the purpose of Brick Manufacturing to be valid till December 2021.

WHEREFORE, THE PARTIES HERETO HEREBY MUTUALLY AGREE AS FOLLOWS:

1. M/s Astha Fly Ash Bricks shall submit incorporation of company under small scale industry category from District Industries department to manufacture and sell the products made up of fly ash
2. Flyash shall be made available to M/s Astha Fly Ash Bricks at KMPCL ash dyke or Fly Ash silo area at free of cost
3. M/s Astha Fly Ash Bricks shall use fly ash in manufacturing of fly ash based products and not divert any other agency with or without intension to sell or any other purposes
4. M/s Astha Fly Ash Bricks shall deploy their own transporters/ authorised persons for lifting the ash from ash dyke/ silo area and transport to their manufacturing facility
5. Loading of fly ash on to M/s Astha Fly Ash Bricks vehicle /authorized transporter trucks shall be done by KMPCL and M/s Astha Fly Ash Bricks shall advice their authorized transporter to submit copies of vehicle specific document viz. RC, FC and PUC and Insurance, driving licences etc to KMPCL security head and obtain the required clearances/approvals before commencing the loading operations
6. M/s Astha Fly Ash Bricks shall regularly intimate to KMPCL regarding deployment trucks/hywas with time schedule for planning of loading machinery to available at Dyke for loading purposes
7. M/s Astha Fly Ash Bricks shall follow the road and route of entry and exit of their HYWA/truck of ash dyke as directed by Plant head/security head
8. KMPCL shall allow weighing of M/s Astha Fly Ash Bricks shall hywas/trucks at their static weigh bridge.
9. M/s Astha Fly Ash Bricks shall instruct their transporters to co-operate with KMPCL loading agency and ensure that no damage occur to HDPE lining of ash dyke due to the transporters vehicle movements



Works

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10. M/s Astha Fly Ash Bricks shall/their authorized transporter shall follow the environment guidelines strictly during fly ash transportation/loading
11. M/s Astha Fly Ash Bricks shall instruct their transporters/drivers to cover their trucks/hywas after loading of the fly ash with Tarpaulin and ensure no ash spillage/ fly away during transportation
12. In event of any breakdown/toppling of the trucks/Hywas M/s Astha Fly Ash Bricks shall and their authorized transporter shall make necessary arrangements for clearing the route and cleaning of the ash spillage using their own machinery for lifting /pushing /pulling.

IN WITNESS WHEREOF, the parties hereto have caused this MOU to be executed by their duly authorized signatories on the date set forth above.

Signed, Sealed and Delivered by Shri K.K. Tarekar
of KMPCL,

For and on behalf of the KSK Mahanadi Power Company Limited



Signed, Sealed and Delivered by Shri Ravi Jain

For and on behalf of the Astha Fly Ash Bricks

In the presence of the following witnesses:-

1. [Signature]

2. [Signature]

ANNEXURE - IV

(in million Tones)

[illegible]

Dt.30.11.2024

Fly Ash Generation & Utilization Details for the period- April to September 2024
KSK Mahanadi Power Company limited, village-Nariyara, Akaltara, C.G.

Month	Coal Consumpt ion	Ash Generation	Ash	Ash Generation (MT)	Supply to Cement Industry (MT)	Supply to Ready Mix plant (MT)	Bricks Manufa cture (MT)	Reclamat ion of Low-lying area (MT)	Ash dyke raising/ constru ction (MT)	Agricul ture work (MT)	Mine filling (MT)	Road Constru ction (MT)	Oth ers (MT)	Total utilization ion (MT)	Utiliza tion (%)
Apr-24	598438	210000	Fly ash	1,89,000	1,53,058	0	7,767	14,518	0	0	10,252	3,406	0	1,89,000	100%
			Bottom Ash	21,000	0	0	0	0	0	0	0	21,000	0	21,000	100%
May-24	721779	253819	Fly ash	2,28,437	1,32,400	0	8,214	16,983	0	0	66,339	4,500	0	2,28,437	100%
			Bottom Ash	25,382	0	0	0	0	0	0	0	25,382	0	25,382	100%
Jun-24	696233	244392	Fly ash	2,19,953	1,05,013	0	5,647	29,088	0	0	62,986	17,218	0	2,19,953	100%
			Bottom Ash	24,439	0	0	0	7,050	0	0	17,389	0	0	24,439	100%
Jul-24	606840	213427	Fly ash	1,92,085	77,619	567	973	29,093	0	0	71,214	12,620	0	1,92,085	100%
			Bottom Ash	21,343	0	0	0	0	0	0	0	0	0	0	0
Aug-24	332939	116831	Fly ash	1,05,148	53,948	268	1,393	769	0	0	35,902	12,868	0	1,05,148	100%
			Bottom Ash	11,683	0	0	0	0	0	0	0	0	0	0	0
Sep-24	421442	148403	Fly ash	1,33,562	93,412	295	3,027	11,474	0	0	60	25,293	0	1,33,562	100%
			Bottom Ash	14,840	0	0	0	0	0	0	0	0	0	0	0
Total	33,77,671	11,86,872	Fly ash	10,68,185	6,15,451	1,130	27,021	1,01,924	0	0	2,46,753	75,905	0	10,68,185	100%
			Bottom Ash	1,18,687	0	0	0	7,050	0	0	17,389	46,382	0	70,821	60%
Grand Total				11,86,872	6,15,451	1,130	27,021	1,08,975	0	0	2,64,142	1,22,287	0	11,39,006	96%

ANNEXURE - V

Photographs of Piezometers facilitating for Ground Water Monitoring around Ash Dyke area
in M/s KMPCL

Piezometer No.-1

21°57'17"N 82°24'34"E



Piezometer No.-2

21°57'24"N 82°23'55"E



Piezometer No.-3

21°57'43"N

82°23'45"E



Piezometer No.-4

21°57'52"N

82°23'57"E



During Project Period:

PZ-1



PZ-2



PZ-3



PZ-4

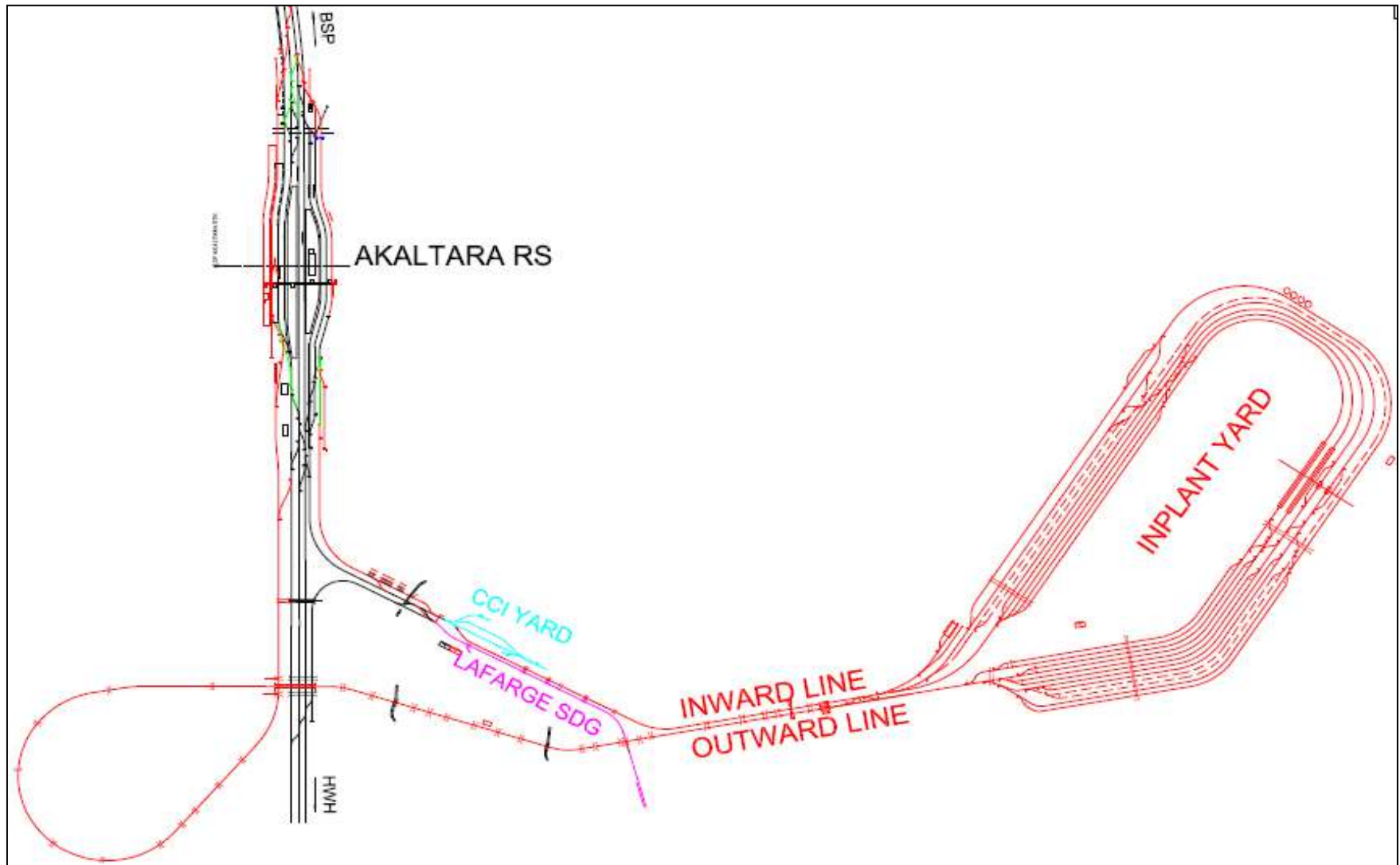


ANNEXURE - VI

Infrastructural facilities at KMPCL site- Railway Transport

- ❖ KMPCL Railway Siding is one of the largest Private Railway Sidings
- ❖ Akaltara Railway Station to Power Plant at Nariyara village and back to Akaltara Railway station via (ROR) (Rail Over Rail Bridge)
- ❖ Railway system constructed as per approved DPR and ESP by SEC Rly
- ❖ The siding takes off from akaltara railway station.
- ❖ 44 kms Track, 8 Major Bridges & 38 Minor Bridges and 60 points & crossings
- ❖ 1 Major 82-meters long ROR(rail bridge over rail track) across Akaltara Station
- ❖ 35-kms of quad copper cable, 70-kms of signal cable, 15-kms of optic fiber cable and Two 1200hp diesel hydraulic locomotives
- ❖ Wagon placements and withdrawls to and from two wagon tipplers and two wagon hoppers.
- ❖ Railway system to transport 17.5 MTPA coal to KSK mahanadi power plant (6x600 MW) ; about 2 to 3 MTPA fly ash from out of power plant.

Infrastructural facilities at KMPCL site- Railway Transport



Railway Infrastructure Facilities for Coal/Fly Ash Handling

- ❖ Entire In-plant Yard is designed in Bulb/Merry-Go-Round
- ❖ For Coal and Fly Ash, Movement of Traffic is maintained unidirectional in clockwise with Reception Yard from Akaltara Up line Connectivity. Unloading/Loading point and dispatch yard and goes to Akaltara Railway Station on Down Line by ROR.
- ❖ For decanting Oil tank both Reception and dispatch shall be from Reception yard.
- ❖ Reception yard is proposed to have 5 Reception Lines for Coal. Reception are connected to 4 connectivity lines leading to 2 Track Hoppers and 2 Wagon Tippers with simultaneous movements on all four lines.

Facilities in reception yard

- ❖ One Line for Oil Tanks, Fly Ash and Two for future Reception
- ❖ One Decanting Loop for unloading and departure of Oil Tanks with either end Top Wiring
- ❖ One BV loop on Decanting line for reversing the BV
- ❖ One Connectivity Line from the above Oil/Fly-ash Line leading to dispatch
- ❖ One future connectivity line to future fly ash dispatch.
- ❖ Silos and beyond upto Departure lines of fly ash shall be non-electrified
- ❖ One spur for sick line and Two spurs for loco maintenance shed.

Railway Infrastructure Facilities for Coal/Fly Ash Handling

Facilities in unloading yard:

- ❖ **Two Track Hoppers and Two Wagon tipplers are provided for unloading coal and all Four can simultaneously unload.**
- ❖ **One Silo Point for Loading Fly ash.**
- ❖ **One future Silo Point for meeting anticipated increase in Fly Ash Movement.**
- ❖ **All the five coal reception lines have been connected to Four pre tipping pre track hopper lines in the in- plant at bulb portion leading each line to wagon tippler/ wagon hopper independently**

Facilities post tipping & dispatch yard:

- ❖ **Eight departure lines (Post Tipping/hopping) are provided.**
- ❖ **Each tippler/hopper is connected to two departure lines so that one train, after getting unloaded, can wait for departure with second train can proceed for uninterrupted unloading simultaneously.**
- ❖ **In addition, Two Departure lines and two future departure lines are provided for Fly ash. These fly ash lines are top wired at exit end for electric locos to clear the load.**

In plant yard Holding capacity

Coal	
Reception lines	5 Trains
Unloading lines	4 Trains
Despatch lines	8 Trains
Total	17 Trains/14 Trains (Optimum)

Fly Ash	
Reception lines	3 Trains
Loading lines	2 Trains
Departure lines	4 Trains
Total	9 Trains/7 Trains (optimum)

Track parameters

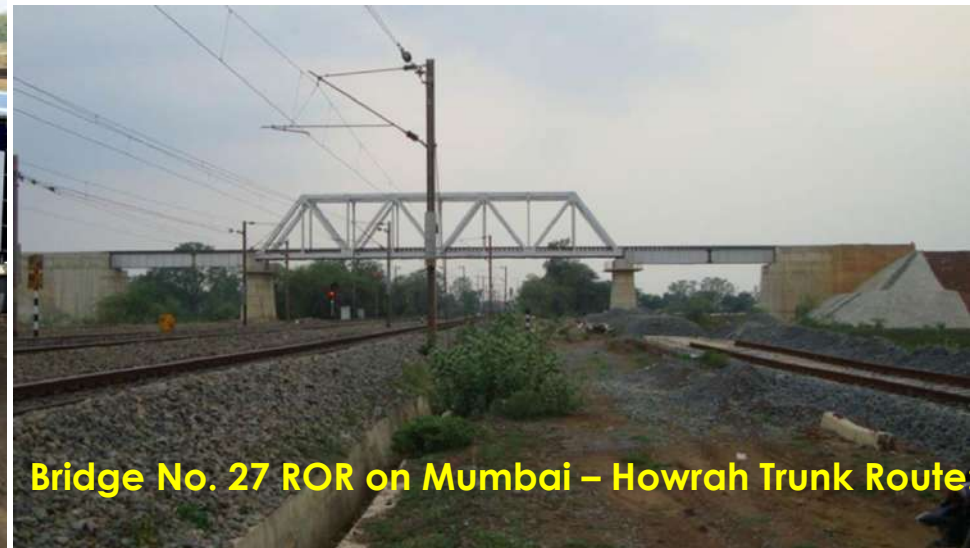
KSKMPCL RAILWAY SIDING AT AKALTARA – TRACK PARAMETERS ON PAR WITH IR'S MAIN LINE

SL No.	PARAMETER	TOLERANCES AS PER P-WAY MANUAL	TRACK READINGS AT KMPCL SIDING	REMARK
1	Guage: (a) On straight (b) On Curves upto 5Degree	-6mm to +6mm -6mm to +15mm	-3mm to +3mm -3mm to +6mm	Better than IR's manual parameter .
2	Alignment (a) ON straight (b) ON Curves upto 5 Degree (versine for 5° curve = 143mm	12mm on 7.5mtrs chord 25% of average versine or 40mm variation whichever is more on 20 mtrs chord	Max-15mm to 30 mm variation in 20mtrs chord	Better than IR's manual parameter
3	Cross Levels	18mm in 3.5 mtrs interval	2 mm RL to 2 mm LL Max 4mm in 3.5mtrs interval	Better than IR's manual parameter

Railway facilities- Coal and Flyash Handling



Railway track on wagon tipplers



Bridge No. 27 ROR on Mumbai – Howrah Trunk Route



View towards CCI

Lafarge Track

KMPCL Track



Take-Off at Akallara Exchange Yard

15/05/2013 12:21

Track parameters



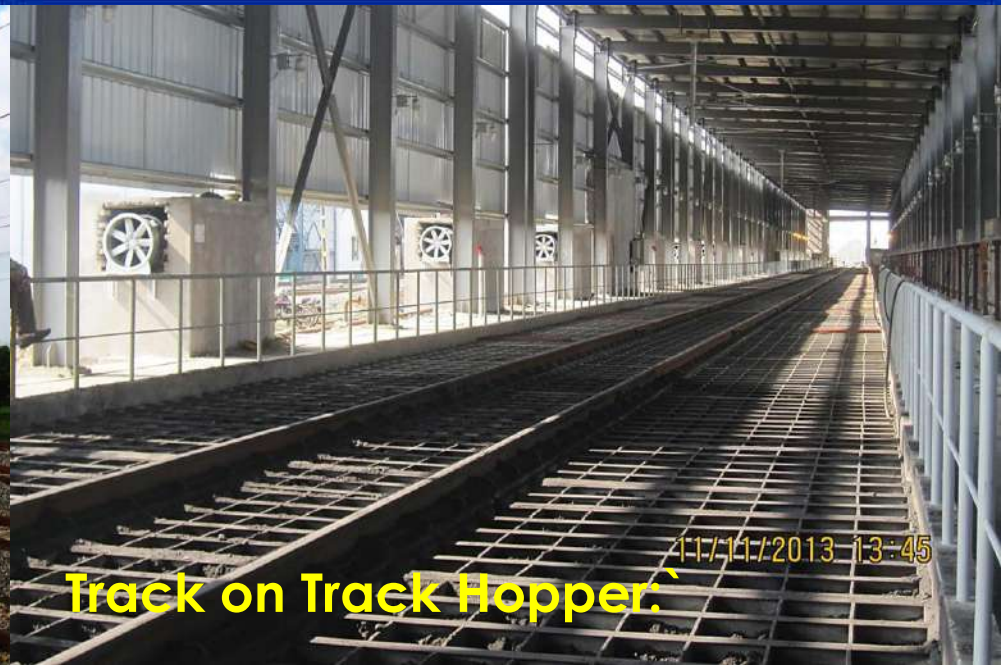
S & T - PANEL BUILDING



S & T - GOOMTY



OHE Charged and S&T in Operation:



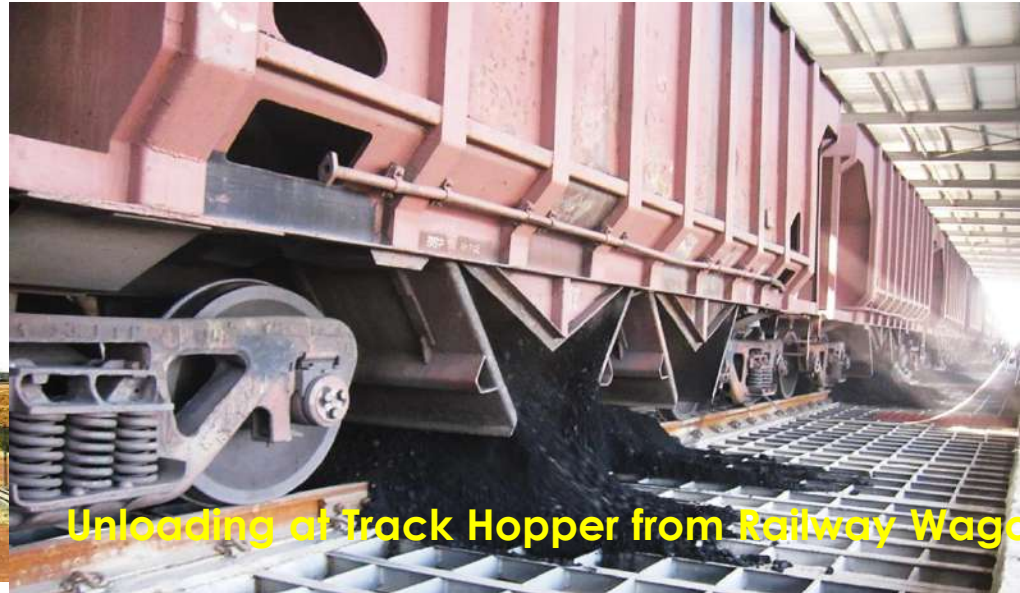
Track on Track Hopper:

11/11/2013 13:45

Railway Infrastructure Facilities for Coal/Fly Ash Handling



Coal Rake in Reception Yard:



Unloading of Track Hopper from Railway Wagon



Box-N Coal Wagon at Wagon Tippler:



Maintenance of Track by Tie Tamping Machine

20/09/2017 11:44

ANNEXURE - VII

GREEN BELT LAYOUT PLAN

Total Greenbelt area: 277 ha

Developed Greenbelt: 277 ha

Planted: 7,20,000 plants



Green Belt Details- M/s KSK Mahanadi Power, Nariyara

The total area (828.46 hectares) of the project site, 33% area (277 hectares) is being developed as green belt all along the boundary of the plant, in block and other available spaces.							
New Plantation							
S. No.	Year	Area (Ha.)	Total nos. of plantation	Total nos. of Plants Survived	% of Survival	Species Planted	Areas of Plantation (In-Campus)
1	2010-11	13	28000	28000	100%	Local Forest Species- Sisam, Banyan, Neem, Karanj, Ajuna, Amla, Peepal, Jamun, Sirus Simarua, Ganga imili, Kadam, Cassia Siamia, Chinour, Mango, Gulmohar, Pelttoform, Satvan	5/6 tiers, in 100 meter width along the periphery of the plant boundary, inside Labour Colony & Living quarters, both sides of all internal Roads, in & around Ash Dyke area, all Office areas, Main Gate, DM plant, Guard Pond, Colling Tower, AHP, CHP areas, Avenue Plantation near NH ROAD-Tarod Boundary and NH ROAD-Banahil Boundary etc.
2	2011-12	26	25000	25000	100%		
3	2012-13	30	50000	50000	100%		
4	2013-14	50	184920	50000	27%		
5	2014-15	38	120000	27000	23%		
6	2015-16	50	125000	75000	60%		
7	2016-17	17	42500	42000	99%		
8	2017-18	53	144580	83330	58%		
Total =		277	720000	380330	53%		
Causality Replacements							
9	FY 2018-19	20	50,000	45,980	92%	Amla, Pepal, Sisam, Pelttoform, Bargad, Neem, Jamun, Karanj, Satvan, Kadam, Sirus Simarua, Ganga imili, Cassia Siamia, Chinour, Arjuna, Mango, Gulmohar	CHP area, Near Ash dyke, AHP, Boundary wall side, Main Gate Road side, Reservoir gate side, Near Time office, Behind cooling tower, in & around DM Plant, infront of STP, Labour Colony, Gate no.-10, Back side of Nursery etc.
10	FY 2019-20	26	65,000	55,000	85%		
11	FY 2020-21	14	50,000	36,000	72%		
12	FY 2021-22	18	46,100	40,350	88%		
13	FY 2022-23	19	49,000	47,600	97%		
14	FY 2023-24	11	28,697	27,925	97%		
15	FY 2024-25	12	29,897	29,204	98%		
Total =		120	3,18,694	2,82,059	89%		
13	As on date total nos. of plant survived	277	7,20,000	6,62,389	92%		

Action plan for the proposed plantation for the next 03 years

Financial Year	Causality Replacement (nos.)	New Plantation (nos.)	Area (Ha.)	Total Quantity (nos.)	Remarks
FY 2024-25	30,000	2,500	13	32,500	New plantation as well as mortality replacement and shortfall of previous targets to be covered in next 04 years.
FY 2025-26	30,000	2,500	13	32,500	
FY 2025-27	30,000	2,500	13	32,500	
Total	90,000	7,500	39	97,500	

Plantation program organized by KMPCL in the presence of CECB official on 05/09/2024.



Plantation done in the monsoon session-2024



Plantation (Causality Replacement) done in the monsoon session-2024 (Peepal, Neem, Karanj, Jamun, Mango etc. Planted)



Plantation (Causality Replacement) done in the monsoon session-2024 (Peepal, Neem, Karanj, Jamun, Mango etc. Planted)



Mass Plantation done on the occasion of World Environment Day-5th June 2024 (Peepal, Neem, Karanj, Jamun, Mango etc. Planted)



Plantation at CHP area on 5th June 2024



Plantation developed near Main Gate & Time Office area of KMPCL:



Green Belt developed along the periphery of the Boundary:



Near Reservoir & Labour colony:



Green Belt developed at both side of Internal Roads inside plant premises:



In & around DM Plant



Plantations near Labour colony to Ash pond area:



Plantations near Ash pond area:



Plantations near South Gate to Ash dyke area:



Near Fire, Safety & Occupational Health Office road side:



Near Guard Pond, STP and Nursery area:



Plantations near Silo area:



Near Switch Yard & Cooling Tower:



Plantations near Workshop area:



In & around DM Plant and Road towards O&M Store:



Near Block Office, Reservoir & Nursery Road:



Near Material carrying road to weigh, bridge (both sides):



Green Belt Details- M/s KSK Mahanadi Power, Nariyara



Railway side plantation



Plantation along with Boundaries



In & around Coal Handling Plant:



In & around Coal Handling Plant:



in front of CCR Building:



Garden Development



Near Time Office:



In front of Cooling Tower:



In & around DM Plant area:



KMPCL own Nursery:



Green Belt Details- M/s KSK Mahanadi Power, Nariyara



Green Belt Details- M/s KSK Mahanadi Power, Nariyara



Green Belt Details- M/s KSK Mahanadi Power, Nariyara

Different species of saplings developed in KMPCL own Nursery,
(Neem, Karanj, Chatian, Peltophorum, Chakundi, Baniyan etc.)



ANNEXURE - VIII

KSK Mahanadi Power Company Limited

Corporate Social Responsibility – Expenditure as Capital Cost from Oct.2009 to Mar. 2020

Sl.no.	Focus Area	Total Capital Cost Expenditures (In Crore)
a1	Education	32643242
a2	Health Care	271245531
a3	Sustainable Development	26287457
a4	Infrastructure Development	160396745
a5	Cultural & Community Support	20847941
a6	Miscellaneous expenses	7471204
	Sub Total - (a)	518892120
b	Cost of Ambulance - (b)	512710
c	Total - (c) = (a+b)	519404830
d	Corporate Donations - (d)	21000000
	Grand Total	540404830
	In crore	54.04

ANNEXURE-VIII (A)

KSK Mahanadi Power Company Limited

Corporate Social Responsibility – Expenditure as Recurring cost from April to September 2024

Sl.no.	Focus Area	Apr' 24 to Sep' 24
a1	Education	19,60,000
a2	Health Care	11,81,121
a3	Sustainable Development	0
a4	Infrastructure Development	2,52,400
a5	Cultural & Community Support	31,303
a6	Miscellaneous expenses	24,770
	Sub Total - (a)	34,49,594
b	Cost of Ambulance - (b)	0
c	Total - (c) = (a+b)	34,49,594
d	Corporate Donations - (d)	0
	Grand Total	34,49,594
	In crore	0.34

CORPORATE SOCIAL RESPONSIBILITY

**HALF YEARLY PROGRESS REPORT
(April 2024 to September 2024)**



KSK MAHANADI POWER COMPANY LIMITED
(GROUP COMPANY OF KSK ENERGY VENTURES LIMITED)

CSR Half Yearly Progress Report - Apr. 2024 to Sep. 2024



Apr' 24 to Sep' 24

(Quarterly news archive of Corporate Social Responsibility programs)

KSK MAHANADI POWER COMPANY LIMITED

CSR Activities Expenses : from April 2024 to September 2024

Sl.	Details of CSR activities	Expenses	Year	Villages
A.	Education & Capacity Building			
1	Provided Financial Support for education to 416 Project affected persons in 04 Private Schools	1960000.0	2024-25	Project Villages
	Total	1960000.0		
B.	Health & Family Welfare			
2	Emergency Ambulance Service provided to 5066 villagers	660252.00	2024-25	Project Villages
3	Organized 2465 Health Camps & 96787 Persons benefitted.	49416.00	2024-25	Project Villages
4	Provided Water through water tanker in village Nariyara and Banahill	378278.00	2024-25	Nariyara
5	Provided & installtion of submersible Pump cable(5 HP) at ward no 08 in village Tarod and Nariyara	93175.00	2024-25	Project Villages
	Total	1181121.0		
D.	Infrastructure Development			
6	Repairing and maintenance work of OHWT and Hand pump at Project Villages	54250.00	2024-25	Project Villages
7	Provided Dust filling work in village Nariyara and Baanahill	170000.00	2024-25	Project Villages
8	Drainage line cleaning work at Nariyara	28150.00	2024-25	Rogda
	Total	252400.0		
E.	Cultural & Community Support			
9	Distribution of Prizes fro Cricket Tournament in Rogda Village	31303.0	2024-25	Project Villages
	Total	31303.0		
F.	Miscellaneous Expenses			
10	Meetings /Training/ Stationary & Other Expenses	17444.0	2024-25	Others
11	Support of Vehicle for CSR Activities	3303.0	2024-25	Others
12	Support of Field Assistant	4023.0	2024-25	Others
	Total	24770.0		
	Grand Total	34,49,594.00		

(Rs.Thirty four lakhs forty nine thousand five hundred ninety four Only)

A. EDUCATION & CAPACITY BUILDING

Provided Financial Support for education to 416 Project affected Person Childrens

During this Half yearly Period from April 2024 to Sept 2024 KSK Mahanadi Power Company Limited provided financial support for Schooling to 559 students. These students are studious and belong to land losers family of our project affected villages. KMPCL CSR Deptt has identified the need of family and provided financial assistance of accomplish their study. With this support students from land losers family are studing in CBSE schools . During the month of July 2024, KSK Mahanadi Power Company Limited Collaborated from Different Private schools in Aklatara and given financial support for students of high and higher secondary schools. During session 2024-25, there are total 559 Students they belong to 416 Project affected Person. KSK Mahanadi Power Company Limited focused on Skill Development of project affected villages. KMPCL provided financial support to 416 Project affected Persons. These students are identified from various Project affected family. These Students wanted to get education from CBSE Schools, but due to their poor finacial condition they were unable to get techincal trainings. By getting support from KSK Mahanadi Power Company Limited, these students have started their Schooling from Akaltara. Getting admission in CBSE Schools these students will learn livelihood skills for betterment of their lives. Earlier, KMPCL had provided financial support to 197 local youths for Industrial Training.

List of Private Schools

School Name	Actual Admission PSP	Actual Admission Children
1) AGHORE VIDYAPEETH, PODIDALHA, AKALTARA	15	24
2) SARASWATI SHISHU MANDIR	219	274
3) UNIQUE INTERNATIONAL SCHOOL, PAKARIA, LATIA	30	51
4) ST. XAVIER HIGHER SECONDARY SCHOOL, AKALTARA	152	210
	416	559

B.HEALTH CARE

Emergency Ambulance Provided to 286 Project affected villages

The CSR department of KSK Mahanadi Power Company Limited is providing ambulance facilities to the persons of affected villages during emergency. Any kind of accident, urgency or emergency is informed to the CSR Department. Seeing the situation and availability of vehicle CSR ambulance is being provided. This is a 24 hours 7 days facility means our ambulance is always ready to provide services for any kind of emergency at village level. During the half yearly period from April 23 to Sept 23 total 230 people received benefit of emergency ambulance services. Villagers are getting larger benefit of this emergency ambulance service.

Si	Village	Person Benefitted
1	Nariyara	113
2	Taroud	38
4	Latiya	19
5	Jhalmala	35
6	Pakariya	12
7	Akaltara	01
8	Murlidih	01
9	Rogda	28
10	Amora	11
11	Banahill	09
12	Others	19
Total		286

Supply of Drinking Water by water tanker in village Banahill & Nariyara

During Summer season water level at village Banahill & Nariyara decreases, So in this half yearly period from April 24 to Sept 24 there was shortage of water supply in these villages , By seeing the situation Both Gram panchayat Requested to CSR Dept KMPCL to arrange Drinking water in Differernt wards. As per the requirement CSR Dept of KMPCL Provided supply of Drinking water to 3085 Households through water tanker. For this both Gram



Supply of drinking water by water tanker in ward no. 12 & 04 of Nariyara

Panchayats had given thanks to CSR Deptt.



Supply of drinking water by water tanker in ward no. 1 & 2 of Banahill

Si.	Village	Total no. of trip for drinking water supply	Total no. of benefitted Household
1	Nariyara	60	2092
2	Banihill	60	985
	Grand Total	120	3085

C. SUSTAINABLE DEVELOPMENT

Provided Animal Husbandary Support Services to 76 Animals

KSK Mahanadi Power Company Limited provided support for animal husbandry services in our affected villages. During transition of season, animal becomes affected from infections. A trained veterinary support staff is caring animals from different diseases. The veterinary services are improved now in the project villages. Farmers are getting better veterinary services for agricultural activities. During this Half Yearly Period from April 24 to Sept 24 total 84 animals are treated. Villagers are happy by getting service from KMPCL

Details of Animal Husbandry services in Half yearly 2024-25

Sr no	Month	Beneficiaries
1	Apr-24	13
2	May-24	10
3	Jun-24	10
4	Jul-24	12
5	Aug-24	10
6	Sep-24	26
Total		81



D. INFRASTRUCTURE DEVELOPMENT

Repairing and Maintenance work of Community Building at Village Nariyara

In Nagar Panchayat Nariyara, a community building was constructed at Ward 10 of Patharrapara by gram panchayat before 15 year. Due to lack of maintenance this building required to be repair. This building is very useful for villagers, they use it for several religious, social and family functions like marriage, birth ceremony etc. As per the request of villagers CSR department visited the location and found repairing work of flooring, channel gate and window followed with painting and whitewashing. With support of KSK Mahanadi Power Company Limited, Gram Panchayat Nariyara started repairing as work-agency, Channel gate and windows are repaired, flooring work, White-wash successfully completed



Repairing of community building of Ward 10 of Nariyara village

Repairing of 3 No of Defunct handpump in project affected Villages

During this month this quarter from April 24 to June 24 CSR department of KMPCL repaired 3KMPCL hand pumps of Nariyara , Banahill and Tarod village. This hand pumps were earlier installed by CSR department at project affected village. Handpumps were defunct and require repairing works in this village. Service from a plumber and helper from project affected village received and these Handpumps repaired by them. Villagers are obliged by getting Hand pump repaired and receiving uninterrupted drinking water supply.

Si.	Village	Details of CSR Work	Place
1	Nariyara	KMPCL Hand pump	Near CSEB Office, Ward No. 1
2	Tarod	KMPCL Hand pump	Near Santoshi Chowk,
3	Banahill	KMPCL Hand pump	Jhalmalla road



Repairing of Defunct Hand pump in Project affected Villages



Installation of 5 HP Submersible pump in village Nariyara and Tarod

Drinking Water availability is a major problem in project affected villages. Nariyara is a main affected village of KMPCL CSR Department and having major drinking water problem in various wards and mu halla. There was a lot a problem of Drinking water in the Village panchayat Ram Gudi ward no 12 and in Gupta Galli ward no -05Nariyara. Villagers had demanded from the CSR Department of KMPCL to installation of 5 HP submersible pumps in Ram Gudi Mohalla, to solve the drinking water problem may be sorted out. So that drinking water problem may be sorted out. Gram Panchayat also shown their expression of interest that electricity bill will be owned by them. In same sequence at Village Tarod villagers were facing problems due to water crises So KSKMPCL has also installed 5 HP Submersible pump at near bus stand , Now villagers are getting uninterrupted water. So in this Half Yearly period from April 2024 to Sept 2024 KSKMPCL has Installed 3 new 5 hp Submersible pump.

Si.	Village	Details of CSR Work	Place
1	Nariyara	Installation of 5 HP Submersible pump	Ward no -12 Ramguddi
2	Nariyara	Installation of 5 HP Submersible pump	Near Gupta Galli Ward no -05
3	Tarod	Installation of 5 HP Submersible pump	Near Bus Stand







Installation of 5 HP Submersible pump at Project affected Villages

Installation of 02 set of Hand pump set in Nagar Panchayat Nariyara and Village Tarod

During this Half yearly period from April 2024 to Sept 2024 CSR department of KMPCL has installed 02 set of hand pump at Nariyara and Tarod village. This hand pump was earlier installed by CSR department at project affected village. Handpump set was defunct and require repairing works in this village. Service from a plumber and helper from project affected village received and this hand pump set was replaced by them. Villagers are obliged by getting Hand pump repaired and receiving uninterrupted drinking water supply

Si.	Village	Details of CSR Work	Place
1	Nariyara	Installation of 1 no of Hand Pump Set	Ward no -01 Bhata para
2	Tarod	Installation of 1 no of Hand Pump Set	Near CSEB office



Installation of hand pump set at Project affected Villages

Dust Filling work at Nagar Panchayat Nariyara

During Rainy seasons, huge Water is deposited at the campus of Govt. Primary & Middle School Nariyara, Roads also become full of slurry so children face problems while coming to schools. As per request of school and panchayat, KSK Mahandi Power Coampny has provided support for repairing of roads of school. CSR department has provided stone dust and spread it in to the small pits. Now school staff and children are very happy and thanked KSK Mahanadi Power Company Limited for this work . In the same sequence in village Banahill KSKMPCL has provided Dust in different wards in this half yealy perod form April 2024 to September 2024 . Now the villagers of Banahill are happy and thanked KSKMPCL fordust filling work in village.



Dust Filling work in Project Villages

Insatallation of 3 face wire for 5 hp Submersible pump at Village Nariyara

During this Half yearly Period from April 2024 to Sept 2024 Sarpanch Gram panchayat Nariyara has requested to KMPCL CSR Department for the repair and installation of Repairing of Panel and wire Submersible Pump (5HP) at Near Panjab National Bank ward No 10 Nariyara. This Submersible pump 53HP) is used to supply drinking water in Villagers Nariyara and became defunct few days, and villagers were unable to get the drinking water. As per request KMPCL has repaired and installation of Repairing of Panel and wire Submersible Pump (5HP) at Near Panjab National Bank ward No 10 Nariyara. Now villagers are getting regular and interrupted drinking water supply



Repairing of Panel and wire Submersible Pump (3HP) at Near Panjab National Bank ward No 10 Nariyara

E . CULTURAL AND COMMUNITY SUPPORT

During this Half yearly period from April 24 to September 24 CSR department of KMPCL has been distributing of sport item in financial support of cricket competition Rogda As per request Cricket coopetition Committee Villager's and Villager's Sarpanch of CSR Department. CSR Department has immediately provided sport item cricket completion . For this cooperation KMPCL the cricket competition committee, villagers and village Sarpanch Has given KMPCL Mahanadi power Company Ltd has been thanks.



Distributing of Sport Item Cricket competition

ANNEXURE - IX

Photographs of ESP+FF installed in KMPCL



ENVIRONMENTAL MONITORING REPORT
FOR
6x600 MW COAL BASED POWER PLANT
OF KSK MAHANADI POWER COMPANY LTD
AT NARIYARA, JANJGIR-CHAMPA DISTRICT, CHHATTISGARH

MONTHLY REPORT: APRIL-2024


Client:

KSK Mahanadi Power Company Ltd
Nariyara, Chhattisgarh

Prepared by:



VIMTA Labs Ltd.
142, IDA, Phase-II, Cherlapally
Hyderabad – 500 051, Telangana State
www.vimta.com, env@vimta.com

	<p>Monthly Environmental Monitoring Report for 6x600 MW Coal Based Power Plant of KSK Mahanadi Power Company Limited at Nariyara Village, Janjgir-Champa District, Chhattisgarh</p> <p style="text-align: right;">April 2024</p>
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1.0 INTRODUCTION

KSK Mahanadi Power Company Limited has installed 3 X 600 MW Power Plant at Narayana, Janjgir Champa District, Chhattisgarh.

2.0 PROCESS DESCRIPTION

The 6x600 MW Power Plant has been constructed as a two phase configuration of 2x1800 MW unit, with two boilers. The project involves 6 Pulverized boiler, steam at 174 bars at 540 °C with six condensing turbo generator set having generating capacity of 600 MW of power each. Out six Units three units under operation and balance units are under construction.

3.0 DESCRIPTION OF ENVIRONMENT

The coal based thermal power plant is located near Nariyara village, Janjgir-Champa District, Chhattisgarh. The index map of the power plant and 10-km radius study area map are shown in **Figure-1** and **Figure-2** respectively.

The air, noise and water sampling locations are given in **Figure-3**, **Figure-4** and **Figure-5**.



Source: Maps of India

FIGURE-1
INDEX MAP

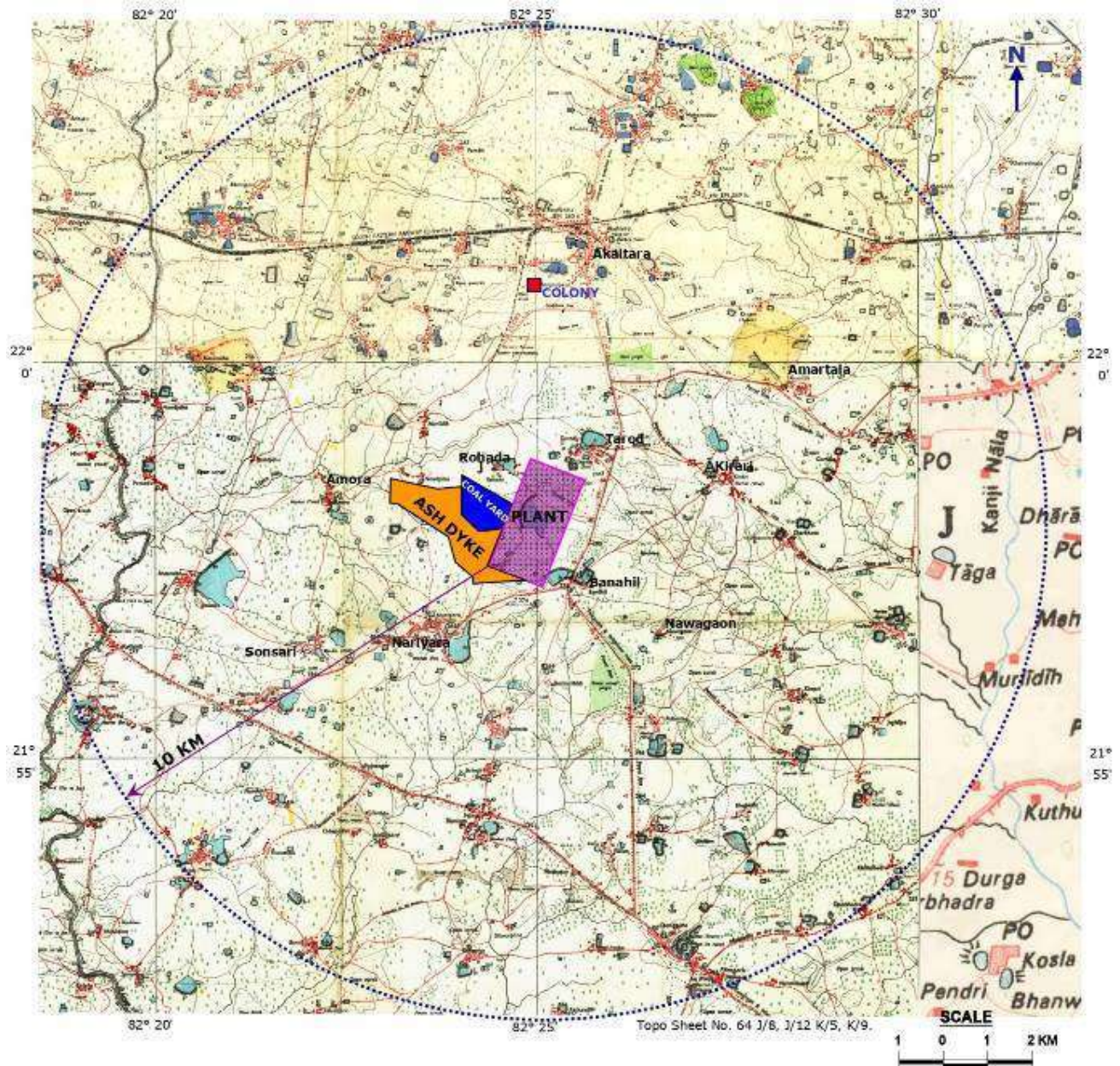


FIGURE-2
STUDY AREA MAP OF 10-KM RADIUS

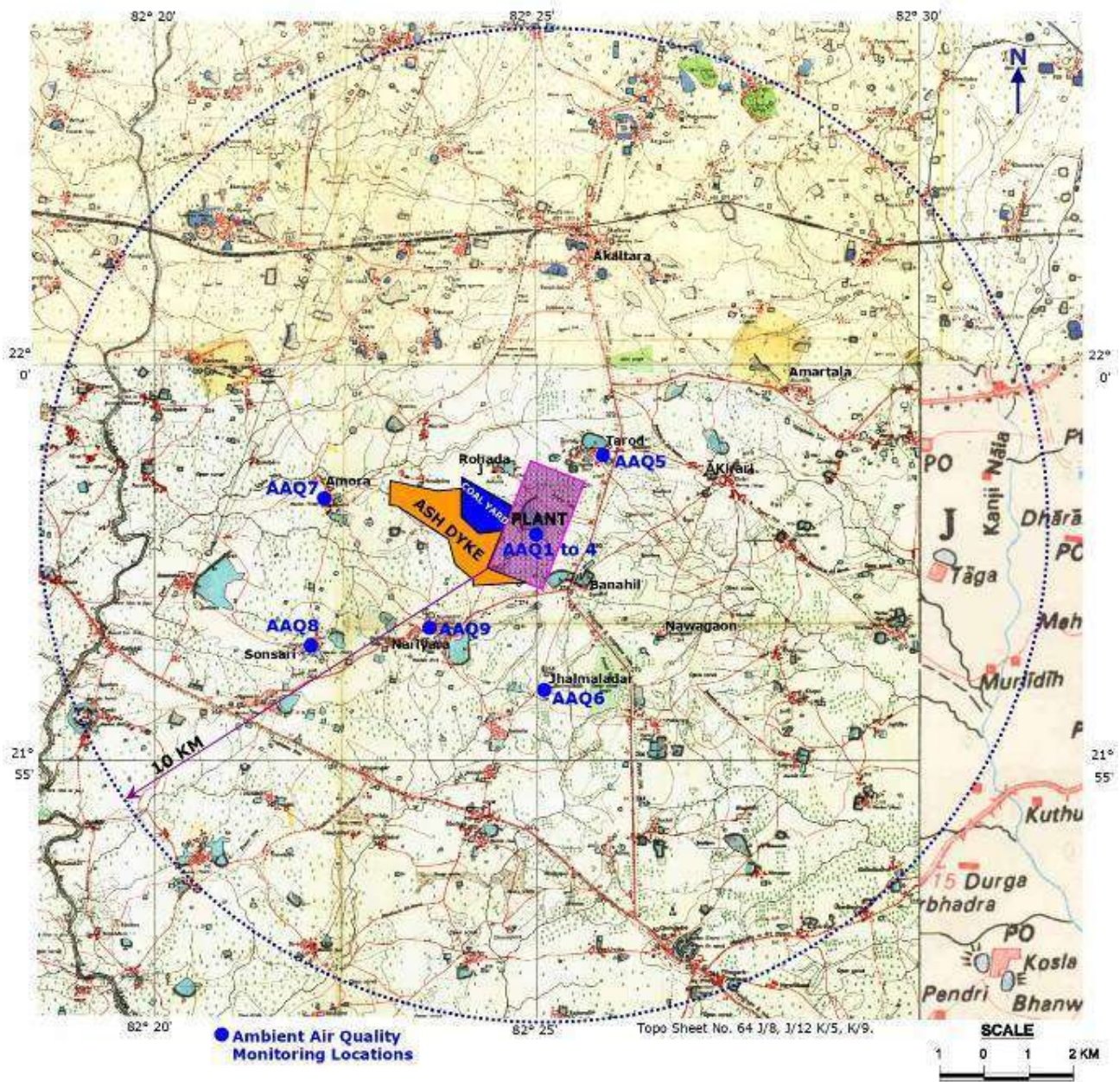


FIGURE-3
AMBIENT AIR QUALITY LOCATIONS

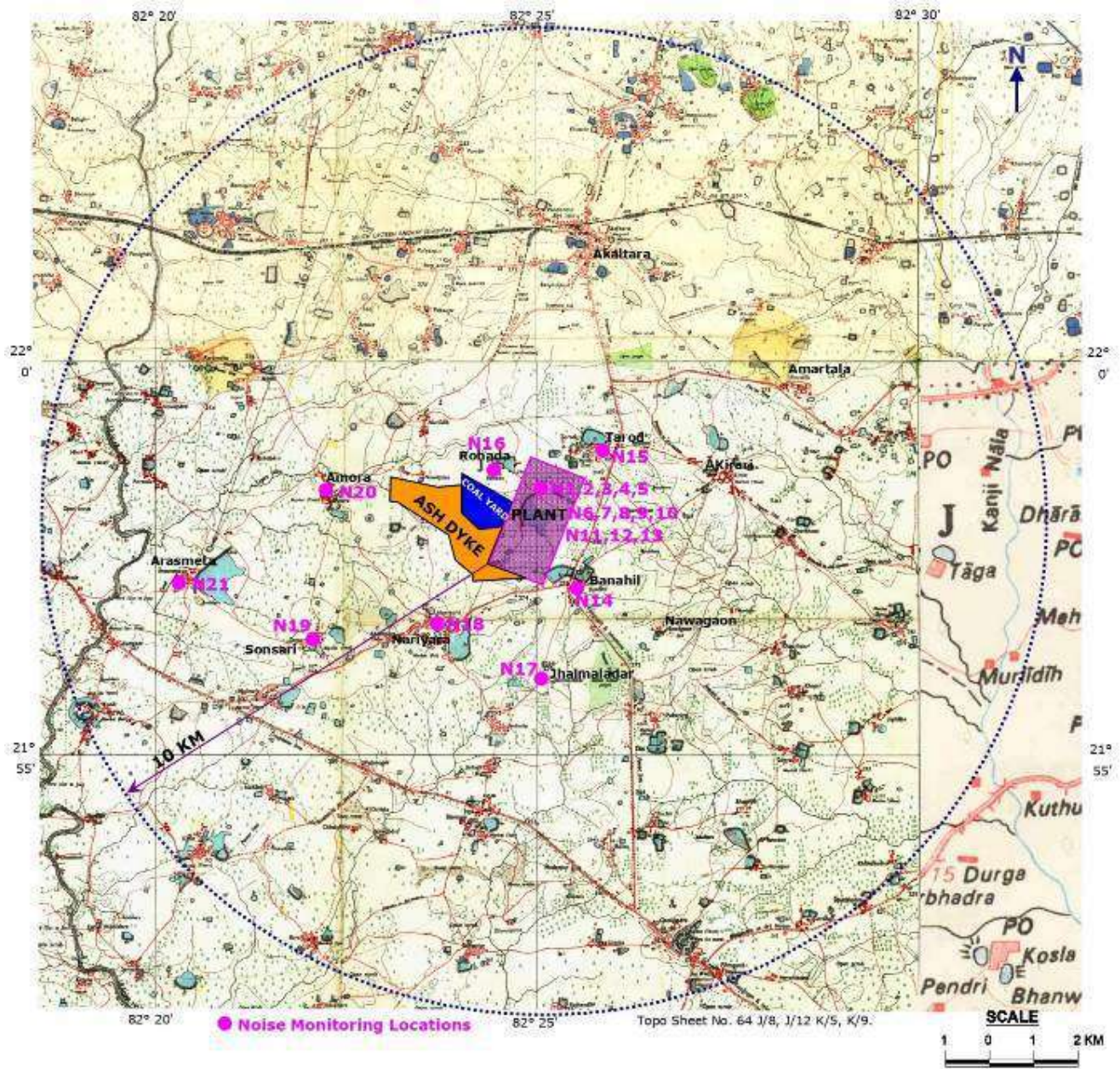


FIGURE-4
NOISE MONITORING LOCATIONS

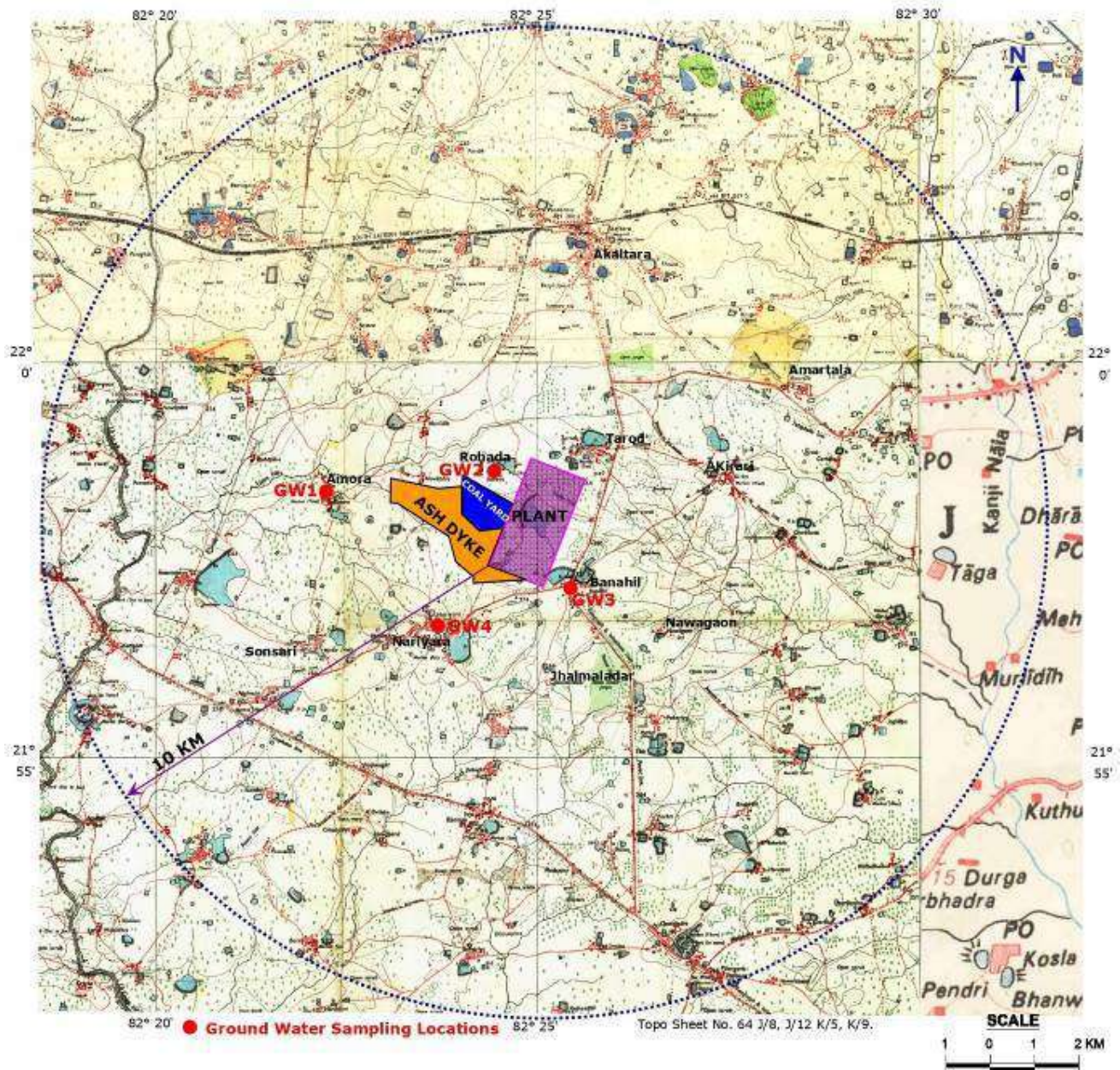



FIGURE-5
GROUND WATER SAMPLING LOCATIONS

	Monthly Environmental Monitoring Report for 6x600 MW Coal Based Power Plant of KSK Mahanadi Power Company Limited at Nariyara Village, Janjgir-Champa District, Chhattisgarh April 2024
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4.0 Scope of Work

M/s KSK Mahanadi Power Company Limited is regularly carrying out the environmental monitoring in and around plant site, as it is a requirement under consent for establishment and consent to Operate from CECB, Chhattisgarh. KSK Mahanadi Power Company Limited entrusted the job of regular environmental monitoring to M/s. Vimta Lab Ltd, Hyderabad.

Monitoring of Ambient Air Quality, water quality and noise level measurement are part of the scope of work given to M/s Vimta Lab Ltd. The environmental monitoring study has been carried out at the following locations:

A] Ambient Air Quality

TABLE-1
AMBIENT AIR QUALITY MONITORING LOCATIONS

Location Code	Location Name	Direction w.r.t Plant	Distance from Plant (Km)
Inside the Premises			
AAQ1	BTG area	-	-
AAQ2	CHP area	-	-
AAQ3	DM Plant area	-	-
AAQ4	Ash handling area	-	-
Outside the Premises			
AAQ5	Tarod Village	NNE	0.8
AAQ6	Jhalmala Village	S	2.2
AAQ7	Amora Village	W	4.0
AAQ8	Sonsari Village	SW	4.3
AAQ9	Nariyara Village	SSW	1.8


B] Stack monitoring

Power Plant Unit –II, Unit – III and Unit - IV

C] Ambient Noise Levels

TABLE-2
AMBIENT NOISE LEVEL MONITORING LOCATIONS

Location Code	Location Name	Direction w.r.t Plant	Distance from Plant (Km)
Inside the Premises			
N1	TG floor	-	-
N2	Cooling tower	-	-
N3	Main Gate	-	-
N4	Boiler feed pump	-	-
N5	Admin Building area	-	-
N6	CHP Machine area	-	-
N7	AHP area	-	-
N8	Ash Silo area	-	-
N9	CW Pump house	-	-
N10	Compressor 1	-	-
N11	Compressor 2	-	-
N12	Compressor 3	-	-
N13	Compressor 4	-	-
Outside the Premises			
N14	Banahil Village	E	0.7
N15	Tarod Village	NNE	0.8

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Location Code	Location Name	Direction w.r.t Plant	Distance from Plant (Km)
N16	Rogda Village	NW	1.5
N17	Jhalmala Village	S	2.2
N18	Nariyara Village	SSW	1.8
N19	Sonsari Village	SW	4.3
N20	Amora Village	W	4.0
N21	Arasmeta Village	W	6.8

D] Ground Water Sampling Locations

TABLE-3
GROUND WATER SAMPLING LOCATIONS

Location Code	Location Name	Direction w.r.t Plant	Distance from Plant (Km)
Ground Water Locations			
GW1	Amora Village	W	4.0
GW2	Rogda Village	NW	1.5
GW3	Banahill Village	E	0.7
GW4	Nariyara Village	SSW	1.8
Ash Pond Ground Water Locations			
GW5	Ash pond Location-1	--	--
GW6	Ash pond Location-2	--	--
GW7	Ash pond Location-3	--	--
GW8	Ash pond Location-4	--	--

E] Waste water samples Locations

TABLE-4
WASTE WATER SAMPLING LOCATIONS

Sr. No.	Code	Location
Unit –I		
1	WW1	CT blow down
2	WW2	Boiler blow down
3	WW3	Condenser Cooling Water
4	WW4	Guard pond
5	WW5	STP Outlet

F] Water Depth Sampling Locations

TABLE-5
WATER DEPTH SAMPLING LOCATIONS

Location Code	Location Name	Direction w.r.t Plant	Distance from Plant (Km)
Ground Water Depth Locations			
GW1	Plant Site	--	--
GW2	Nariyara Village	SSW	1.8
GW3	Amora Village	W	4.0
GW4	Rogda Village	NW	1.5
Ash pond Area			
ASH1	Ash pond Location-1	--	--
ASH2	Ash pond Location-2	--	--
ASH3	Ash pond Location-3	--	--
ASH4	Ash pond Location-4	--	--

5.0 METHODOLOGY OF MONITORING AND SAMPLING PROCEDURES

5.1 Ambient Air Quality Monitoring

Respirable dust samplers with suitable calibration were located in selected sampling stations as mentioned above, based on topography and wind pattern of the region. Samples were collected continuously on 24 hours average basis for PM_{2.5}, PM₁₀, SO₂, NO₂, Carbon Monoxide (CO), Ammonia, Lead, Arsenic, Nickel, Ozone, Benzene and Benzo(a)pyrene. Air samples were analyzed for SO₂ by West- Gaeke Method using Spectrophotometer at a wave length of 560 nm. For NO₂, the analysis was carried out using Sodium Arsenite Method, spectrophotometrically at a wave length of 540 nm. The Fine Particulate Matter PM_{2.5} & PM₁₀ is calculated by using gravimetric analysis. Pre-weighed Teflon filter paper and whatman GFA filter papers were used for determining the respirable particulate matter. The details of the sampling locations are presented in below **Table-1**.

5.2 Stack Gas Sampling

The stack sampling was carried out using ISO-Kinetic Method using pre-calibrated stack kit. Glass fiber thimbles were used for collecting particulate matter.

5.3 Ambient Noise Monitoring

Sound Pressure Levels (SPL) measurements were recorded at 8 locations. The readings were taken for every hour for 24-hrs. The day noise levels have been monitored during 6 am to 10 pm and night noise levels during 10 pm to 6 am at all the locations covered in the study area and 13 work zone noise levels. The details of the sampling locations are given in **Table-2**.


During each hour parameters like L10, L50, L90 and Leq were directly computed by the instrument based on the sound pressure levels.

5.4 Water Sampling

Water sample were collected and analyzed for Total Suspended Solids, Total Dissolved Solids, pH, Dissolved oxygen, Chemical Oxygen Demand, Biochemical Oxygen Demand, Oil & Grease, chlorides, sulphates, phosphates(Total), Zinc, chromium, copper, Iron(Total), as per standard methods published by APHA. The details of the sampling locations are given in **Table-3**.

5.5 Waste water Sampling

Waste water samples were collected and analyzed for Total Suspended Solids, Total Dissolved Solids, pH, Dissolved oxygen, Chemical Oxygen Demand, Biochemical Oxygen Demand, Oil & Grease, chlorides, sulphates, phosphates(Total), Zinc, chromium, copper, Iron(Total), as per standard methods published by APHA. The details of the sampling locations are given in **Table-4** and Water Depth levels of sampling locations are given in **Table-5**.

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6.0 QUALITY ASSURANCE

Vimta Labs Ltd is accredited by NABL Govt. of India and follows quality systems as per ISO/IEC 17025-2017. The QA/QC procedures are laid prior to sample collection and laboratory analysis. It includes the standard procedures of sample collection, preservation, transportation and laboratory analysis with all documented procedures and continuous monitoring of Quality Control division.

7.0 RESULTS OF SURVEY DATA

The monitoring results of Ambient Air Quality analysis for the month of **April-2024** are presented in below **Table-6 to Table-10**.

7.1 Ambient Air Quality Monitoring Results

TABLE-6
AAQ MONITORING RESULTS

Monitoring Date	PM2.5	PM10	SO ₂	NO ₂	CO
	Particulate Matter(µg/m ³)		µg/m ³	µg/m ³	mg/m ³
BTG area – AAQ1					
04.04.2024	38.2	65.2	15.2	16.3	0.287
05.04.2024	35.3	60.5	14.1	16.1	0.239
09.04.2024	39.6	58.3	13.6	14.6	0.264
12.04.2024	33.5	62.4	15.4	15.9	0.276
16.04.2024	37.1	56.4	14.6	16.4	0.265
19.04.2024	39.2	61.8	15.0	16.0	0.205
22.04.2024	40.3	66.4	12.4	13.8	0.275
24.04.2024	33.7	57.0	14.6	15.6	0.226
Max	40.3	66.4	15.4	16.4	0.287
Min	33.5	56.4	12.4	13.8	0.205
Avg	37.1	61.0	14.4	15.6	0.255
98%ile	40.2	66.2	15.4	16.4	0.285
CHP area – AAQ2					
04.04.2024	40.6	70.1	14.6	16.6	0.274
05.04.2024	36.9	62.2	13.7	14.7	0.291
09.04.2024	37.3	68.7	15.3	16.5	0.317
12.04.2024	43.8	66.3	16.4	18.1	0.303
16.04.2024	38.2	73.9	13.3	16.9	0.302
19.04.2024	40.4	65.5	14.9	15.4	0.261
22.04.2024	37.8	71.1	16.3	17.5	0.290
24.04.2024	41.5	67.4	14.8	16.2	0.276
Max	43.8	73.9	16.4	18.1	0.317
Min	36.9	62.2	13.3	14.7	0.261
Avg	39.6	68.2	14.9	16.5	0.289
98%ile	43.5	73.5	16.4	18.0	0.315
Limits as per NAAQS	60	100	80	80	02
Test Methods	Gravimetric Method		Improved West & Geake Method	Modified Jacob & Hochheiser Method	NDIR spectroscopy method

Teflon filter paper was used in PM2.5 & whatman filter paper for PM10 weighed in Mettler electronic balance and computed as per standard methods PM2.5, PM10, SO₂, NO_x is monitored on 24 hrs. Basis CO is monitored on 8 hours basis All the values are expressed in µg/m³ except CO is measured in mg/m³


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TABLE-7
AAQ MONITORING RESULTS

Monitoring Date	PM2.5	PM10	SO ₂	NO ₂	CO
	Particulate Matter(µg/m ³)		µg/m ³	µg/m ³	mg/m ³
DM plant area – AAQ3					
04.04.2024	36.2	60.2	14.0	15.8	0.243
05.04.2024	30.5	52.3	12.9	13.3	0.238
09.04.2024	33.4	59.1	13.4	15.1	0.230
12.04.2024	32.1	60.3	14.2	16.3	0.228
16.04.2024	36.2	62.5	12.2	14.5	0.277
19.04.2024	33.3	55.7	14.2	15.0	0.233
22.04.2024	38.4	61.1	15.5	14.9	0.226
24.04.2024	33.2	54.8	13.1	15.0	0.219
Max	38.4	62.5	15.5	16.3	0.277
Min	30.5	52.3	12.2	13.3	0.219
Avg	34.2	58.3	13.7	15.1	0.237
98%ile	38.1	62.3	15.3	16.2	0.272
Ash handling area – AAQ4					
04.04.2024	37.3	70.7	14.7	16.8	0.326
05.04.2024	42.3	67.3	13.1	15.7	0.302
09.04.2024	40.1	72.1	12.4	13.5	0.288
12.04.2024	34.7	60.0	17.3	18.5	0.337
16.04.2024	41.6	70.1	13.0	15.0	0.292
19.04.2024	38.2	65.5	15.8	18.8	0.303
22.04.2024	36.6	70.3	15.2	17.2	0.316
24.04.2024	40.7	66.2	14.9	16.8	0.286
Max	42.3	72.1	17.3	18.8	0.337
Min	34.7	60.0	12.4	13.5	0.286
Avg	38.9	67.8	14.6	16.5	0.306
98%ile	42.2	71.9	17.1	18.8	0.335
Tarod Village – AAQ5					
04.04.2024	32.5	57.3	12.0	14.9	0.213
05.04.2024	30.2	63.5	13.2	15.1	0.209
09.04.2024	28.8	61.8	12.6	14.7	0.199
12.04.2024	33.1	58.8	10.8	13.1	0.183
16.04.2024	30.0	63.5	13.3	16.1	0.217
19.04.2024	34.8	60.1	11.4	13.6	0.229
22.04.2024	28.9	56.2	12.7	14.4	0.212
24.04.2024	33.9	62.3	13.2	15.2	0.208
Max	34.8	63.5	13.3	16.1	0.229
Min	28.8	56.2	10.8	13.1	0.183
Avg	31.5	60.4	12.4	14.6	0.209
98%ile	34.7	63.5	13.3	16.0	0.227
Jhalmala Village- AAQ6					
04.04.2024	30.7	54.3	10.5	12.8	0.171
05.04.2024	33.1	55.8	11.3	13.7	0.140
09.04.2024	27.8	52.7	9.8	12.6	0.186
12.04.2024	32.3	56.4	10.7	14.3	0.181
16.04.2024	29.8	54.7	11.6	13.9	0.162
19.04.2024	27.8	53.3	12.3	14.0	0.170
22.04.2024	28.7	56.8	10.5	13.2	0.148
24.04.2024	31.9	54.4	9.7	12.8	0.186
Max	33.1	56.8	12.3	14.3	0.186
Min	27.8	52.7	9.7	12.6	0.140
Avg	30.3	54.8	10.8	13.4	0.168
98%ile	33.0	56.7	12.2	14.3	0.186
Limits as per NAAQS	60	100	80	80	02


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TABLE-8
AAO MONITORING RESULTS

Monitoring Date	PM2.5	PM10	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³
	Particulate				
Amora Village - AAQ7					
04.04.2024	33.2	56.7	12.0	14.2	0.139
05.04.2024	28.4	51.9	11.6	12.5	0.166
09.04.2024	29.4	53.7	10.6	13.1	0.148
12.04.2024	31.7	58.9	13.1	15.2	0.169
16.04.2024	29.3	57.6	11.6	13.6	0.182
19.04.2024	30.9	54.5	12.6	14.9	0.151
22.04.2024	27.6	58.5	11.7	12.6	0.194
24.04.2024	32.6	56.9	12.7	13.7	0.156
Max	33.2	58.9	13.1	15.2	0.194
Min	27.6	51.9	10.6	12.5	0.139
Avg	30.4	56.1	12.0	13.7	0.163
98%ile	33.1	58.8	13.0	15.2	0.192
Sonsari Village - AAQ8					
04.04.2024	30.8	60.3	11.4	14.1	0.148
05.04.2024	26.6	59.4	9.6	13.3	0.171
09.04.2024	31.3	58.7	10.7	12.9	0.151
12.04.2024	28.5	60.3	11.7	13.9	0.179
16.04.2024	34.1	57.5	12.4	14.7	0.167
19.04.2024	31.7	62.0	11.5	13.7	0.174
22.04.2024	30.4	52.3	10.5	12.6	0.153
24.04.2024	33.7	58.1	12.2	13.8	0.173
Max	34.1	62.0	12.4	14.7	0.179
Min	26.6	52.3	9.6	12.6	0.148
Avg	30.9	58.6	11.3	13.6	0.165
98%ile	34.0	61.8	12.4	14.6	0.178
Nariyara Village – AAQ9					
04.04.2024	29.1	53.2	10.7	13.6	0.202
05.04.2024	32.2	56.4	11.9	13.6	0.162
09.04.2024	26.8	52.9	13.1	15.2	0.175
12.04.2024	31.0	54.5	11.4	14.1	0.203
16.04.2024	32.1	58.7	12.5	13.9	0.186
19.04.2024	28.2	51.8	11.7	14.9	0.200
22.04.2024	30.2	57.0	10.5	15.2	0.185
24.04.2024	27.3	54.7	12.7	14.3	0.172
Max	32.2	58.7	13.1	15.2	0.203
Min	26.8	51.8	10.5	13.6	0.162
Avg	29.6	54.9	11.8	14.4	0.186
98%ile	32.2	58.5	13.0	15.2	0.203
Limits as per NAAQS	60	100	80	80	02

Teflon filter paper was used in PM2.5 & whatman filter paper for PM10 weighed in Mettler electronic balance and computed as per standard methods PM2.5, PM10, SO₂, NO_x is monitored on 24 hrs. Basis CO is monitored on 8 hours basis All the values are expressed in µg/m³ except CO is measured in mg/m³


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TABLE-9
AAQ MONITORING RESULTS

Monitoring Date & Location	Arsenic ng/m ³	Nickel ng/m ³	Lead µg/m ³	O ₃ µg/m ³	NH ₃ µg/m ³	C ₆ H ₆ µg/m ³	Benzo(a) Pyrene ng/m ³	Hg µg/m ³
BTG area – AAQ1								
04.04.2024	<1.0	1.3	0.002	9.5	<20	<1.0	<0.1	<0.001
05.04.2024	<1.0	1.6	<0.001	7.8	<20	<1.0	<0.1	<0.001
09.04.2024	<1.0	<1.0	0.003	11.8	<20	<1.0	<0.1	<0.001
12.04.2024	<1.0	1.9	0.002	10.7	<20	<1.0	<0.1	<0.001
16.04.2024	<1.0	<1.0	<0.001	11.5	<20	<1.0	<0.1	<0.001
19.04.2024	<1.0	1.5	<0.001	10.7	<20	<1.0	<0.1	<0.001
22.04.2024	<1.0	2.0	0.001	10.2	<20	<1.0	<0.1	<0.001
24.04.2024	<1.0	1.3	0.002	12.7	<20	<1.0	<0.1	<0.001
Max	<1.0	2.0	0.003	12.7	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	7.8	<20	<1.0	<0.1	<0.001
Avg	<1.0	1.6	0.002	10.6	<20	<1.0	<0.1	<0.001
98%	<1.0	2.0	0.003	12.6	<20	<1.0	<0.1	<0.001
CHP area – AAQ2								
04.04.2024	<1.0	1.7	0.002	10.4	<20	<1.0	<0.1	<0.001
05.04.2024	<1.0	1.2	<0.001	13.6	<20	<1.0	<0.1	<0.001
09.04.2024	<1.0	<1.0	0.003	12.2	<20	<1.0	<0.1	<0.001
12.04.2024	<1.0	2.3	0.001	8.8	<20	<1.0	<0.1	<0.001
16.04.2024	<1.0	1.6	0.005	13.3	<20	<1.0	<0.1	<0.001
19.04.2024	<1.0	2.5	0.001	14.6	<20	<1.0	<0.1	<0.001
22.04.2024	<1.0	1.4	0.004	12.2	<20	<1.0	<0.1	<0.001
24.04.2024	<1.0	2.0	0.006	9.9	<20	<1.0	<0.1	<0.001
Max	<1.0	2.5	0.006	14.6	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	8.8	<20	<1.0	<0.1	<0.001
Avg	<1.0	1.8	0.003	11.9	<20	<1.0	<0.1	<0.001
98%ile	<1.0	2.5	0.006	14.5	<20	<1.0	<0.1	<0.001
DM plant area – AAQ3								
04.04.2024	<1.0	<1.0	<0.001	10.3	<20	<1.0	<0.1	<0.001
05.04.2024	<1.0	1.5	0.001	8.4	<20	<1.0	<0.1	<0.001
09.04.2024	<1.0	1.1	<0.001	10.5	<20	<1.0	<0.1	<0.001
12.04.2024	<1.0	1.7	0.002	11.2	<20	<1.0	<0.1	<0.001
16.04.2024	<1.0	<1.0	0.001	9.1	<20	<1.0	<0.1	<0.001
19.04.2024	<1.0	1.6	<0.001	11.2	<20	<1.0	<0.1	<0.001
22.04.2024	<1.0	1.4	0.001	10.6	<20	<1.0	<0.1	<0.001
24.04.2024	<1.0	<1.0	0.002	8.7	<20	<1.0	<0.1	<0.001
Max	<1.0	1.7	0.002	11.2	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	8.4	<20	<1.0	<0.1	<0.001
Avg	<1.0	1.5	0.001	10.0	<20	<1.0	<0.1	<0.001
98%	<1.0	1.7	0.002	11.2	<20	<1.0	<0.1	<0.001

Below Detectable Limit for as and Ni 1.0 ng/m³ Below Detectable Limit for Pb 0.001 µg/m³ Ozone and CO is monitored on 8 hours basis Below Detectable Limit for O₃ 50 µg/m³ Below Detectable Limit for NH₃ 20 µg/m³


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TABLE-10
AAQ MONITORING RESULTS

Monitoring Date & Location	Arsenic ng/m ³	Nickel ng/m ³	Lead µg/m ³	O ₃ µg/m ³	NH ₃ µg/m ³	C ₆ H ₆ µg/m ³	Benzo(a) Pyrene ng/m ³	Hg µg/m ³
Ash handling area – AAQ4								
04.04.2024	<1.0	1.9	0.001	13.1	<20	<1.0	<0.1	<0.001
05.04.2024	<1.0	1.5	0.003	10.3	<20	<1.0	<0.1	<0.001
09.04.2024	<1.0	<1.0	<0.001	11.4	<20	<1.0	<0.1	<0.001
12.04.2024	<1.0	1.3	0.004	14.0	<20	<1.0	<0.1	<0.001
16.04.2024	<1.0	2.0	0.002	9.8	<20	<1.0	<0.1	<0.001
19.04.2024	<1.0	1.7	<0.001	10.4	<20	<1.0	<0.1	<0.001
22.04.2024	<1.0	1.4	0.002	10.5	<20	<1.0	<0.1	<0.001
24.04.2024	<1.0	2.1	0.004	12.3	<20	<1.0	<0.1	<0.001
Max	<1.0	2.1	0.004	14.0	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	9.8	<20	<1.0	<0.1	<0.001
Avg	<1.0	1.7	0.003	11.5	<20	<1.0	<0.1	<0.001
98%	<1.0	2.1	0.004	13.9	<20	<1.0	<0.1	<0.001
Tarod Village – AAQ5								
04.04.2024	<1.0	<1.0	<0.001	5.8	<20	<1.0	<0.1	<0.001
05.04.2024	<1.0	<1.0	<0.001	6.8	<20	<1.0	<0.1	<0.001
09.04.2024	<1.0	<1.0	<0.001	7.6	<20	<1.0	<0.1	<0.001
12.04.2024	<1.0	<1.0	<0.001	6.5	<20	<1.0	<0.1	<0.001
16.04.2024	<1.0	<1.0	<0.001	8.0	<20	<1.0	<0.1	<0.001
19.04.2024	<1.0	<1.0	<0.001	7.0	<20	<1.0	<0.1	<0.001
22.04.2024	<1.0	<1.0	<0.001	5.9	<20	<1.0	<0.1	<0.001
24.04.2024	<1.0	<1.0	<0.001	7.6	<20	<1.0	<0.1	<0.001
Max	<1.0	<1.0	<0.001	8.0	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	5.8	<20	<1.0	<0.1	<0.001
Avg	<1.0	<1.0	<0.001	6.9	<20	<1.0	<0.1	<0.001
98%	<1.0	<1.0	<0.001	7.9	<20	<1.0	<0.1	<0.001
Jhalmala Village- AAQ-6								
04.04.2024	<1.0	<1.0	<0.001	6.3	<20	<1.0	<0.1	<0.001
05.04.2024	<1.0	<1.0	<0.001	7.0	<20	<1.0	<0.1	<0.001
09.04.2024	<1.0	<1.0	<0.001	6.5	<20	<1.0	<0.1	<0.001
12.04.2024	<1.0	<1.0	<0.001	7.2	<20	<1.0	<0.1	<0.001
16.04.2024	<1.0	<1.0	<0.001	4.8	<20	<1.0	<0.1	<0.001
19.04.2024	<1.0	<1.0	<0.001	6.5	<20	<1.0	<0.1	<0.001
22.04.2024	<1.0	<1.0	<0.001	7.0	<20	<1.0	<0.1	<0.001
24.04.2024	<1.0	<1.0	<0.001	6.1	<20	<1.0	<0.1	<0.001
Max	<1.0	<1.0	<0.001	7.2	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	4.8	<20	<1.0	<0.1	<0.001
Avg	<1.0	<1.0	<0.001	6.4	<20	<1.0	<0.1	<0.001
98%	<1.0	<1.0	<0.001	7.2	<20	<1.0	<0.1	<0.001
Limits as per	06	20	1.0	100	400	05	01	-

Below Detectable Limit for as and Ni 1.0 ng/m³, Below Detectable Limit for Pb 0.001 µg/m³ Ozone and CO is monitored on 8 hours basis Below Detectable Limit for O₃ 50 µg/m³ Below Detectable Limit for NH₃ 20 µg/m³



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TABLE-11
AAQ MONITORING RESULTS

Monitoring Date & Location	Arsenic ng/m ³	Nickel ng/m ³	Lead µg/m ³	O ₃ µg/m ³	NH ₃ µg/m ³	C ₆ H ₆ µg/m ³	Benzo(a) Pyrene ng/m ³	Hg µg/m ³
Amora Village – AAQ7								
04.04.2024	<1.0	<1.0	<0.001	6.6	<20	<1.0	<0.1	<0.001
05.04.2024	<1.0	<1.0	<0.001	7.2	<20	<1.0	<0.1	<0.001
09.04.2024	<1.0	<1.0	<0.001	8.3	<20	<1.0	<0.1	<0.001
12.04.2024	<1.0	<1.0	<0.001	5.5	<20	<1.0	<0.1	<0.001
16.04.2024	<1.0	<1.0	<0.001	8.2	<20	<1.0	<0.1	<0.001
19.04.2024	<1.0	<1.0	<0.001	7.4	<20	<1.0	<0.1	<0.001
22.04.2024	<1.0	<1.0	<0.001	7.0	<20	<1.0	<0.1	<0.001
24.04.2024	<1.0	<1.0	<0.001	5.9	<20	<1.0	<0.1	<0.001
Max	<1.0	<1.0	<0.001	8.3	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	5.5	<20	<1.0	<0.1	<0.001
Avg	<1.0	<1.0	<0.001	7.0	<20	<1.0	<0.1	<0.001
98%ile	<1.0	<1.0	<0.001	8.3	<20	<1.0	<0.1	<0.001
Sonsari Village – AAQ8								
04.04.2024	<1.0	<1.0	<0.001	7.0	<20	<1.0	<0.1	<0.001
05.04.2024	<1.0	<1.0	<0.001	8.0	<20	<1.0	<0.1	<0.001
09.04.2024	<1.0	<1.0	<0.001	8.6	<20	<1.0	<0.1	<0.001
12.04.2024	<1.0	<1.0	<0.001	6.8	<20	<1.0	<0.1	<0.001
16.04.2024	<1.0	<1.0	<0.001	7.8	<20	<1.0	<0.1	<0.001
19.04.2024	<1.0	<1.0	<0.001	5.7	<20	<1.0	<0.1	<0.001
22.04.2024	<1.0	<1.0	<0.001	6.9	<20	<1.0	<0.1	<0.001
24.04.2024	<1.0	<1.0	<0.001	5.8	<20	<1.0	<0.1	<0.001
Max	<1.0	<1.0	<0.001	8.6	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	5.7	<20	<1.0	<0.1	<0.001
Avg	<1.0	<1.0	<0.001	7.1	<20	<1.0	<0.1	<0.001
98%	<1.0	<1.0	<0.001	8.5	<20	<1.0	<0.1	<0.001
Nariyara Village – AAQ9								
04.04.2024	<1.0	<1.0	<0.001	5.7	<20	<1.0	<0.1	<0.001
05.04.2024	<1.0	<1.0	<0.001	6.7	<20	<1.0	<0.1	<0.001
09.04.2024	<1.0	<1.0	<0.001	5.8	<20	<1.0	<0.1	<0.001
12.04.2024	<1.0	<1.0	<0.001	6.5	<20	<1.0	<0.1	<0.001
16.04.2024	<1.0	<1.0	<0.001	5.6	<20	<1.0	<0.1	<0.001
19.04.2024	<1.0	<1.0	<0.001	6.3	<20	<1.0	<0.1	<0.001
22.04.2024	<1.0	<1.0	<0.001	5.8	<20	<1.0	<0.1	<0.001
24.04.2024	<1.0	<1.0	<0.001	6.6	<20	<1.0	<0.1	<0.001
Max	<1.0	<1.0	<0.001	6.7	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	5.6	<20	<1.0	<0.1	<0.001
Avg	<1.0	<1.0	<0.001	6.1	<20	<1.0	<0.1	<0.001
98%	<1.0	<1.0	<0.001	6.7	<20	<1.0	<0.1	<0.001
Limits as per NAAQS	06	20	1.0	100	400	05	01	-

Below Detectable Limit for as and Ni 1.0 ng/m³, Below Detectable Limit for Pb 0.001 µg/m³ Ozone and CO is monitored on 8 hours basis Below Detectable Limit for O₃ 50 µg/m³ Below Detectable Limit for NH₃ 20 µg/m³

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7.1.1 Observations (Inside the premises)

PM2.5: The maximum value for PM2.5 observed at CHP area as 43.8 $\mu\text{g}/\text{m}^3$ and minimum value for PM2.5 at DM plant area as 30.5 $\mu\text{g}/\text{m}^3$. The 24 hours applicable limit inside the plant premises 60 $\mu\text{g}/\text{m}^3$ for industrial area.

PM10: The maximum value for PM10 observed at CHP area as 73.9 $\mu\text{g}/\text{m}^3$ and minimum value for PM10 at DM Plant area as 52.3 $\mu\text{g}/\text{m}^3$. The 24 hours applicable limit inside the plant premises 100 $\mu\text{g}/\text{m}^3$ for industrial area.

SO₂: The maximum value for SO₂ observed at CHP plant area as 16.4 $\mu\text{g}/\text{m}^3$ and minimum value for SO₂ at DM Plant area as 12.2 $\mu\text{g}/\text{m}^3$. The 24 hours applicable limit inside the plant premises 80 $\mu\text{g}/\text{m}^3$ for industrial area.

NO₂: The maximum value for NO₂ observed at AHP area as 18.8 $\mu\text{g}/\text{m}^3$ and minimum value for NO₂ at DM Plant area as 13.3 $\mu\text{g}/\text{m}^3$. The 24 hours applicable limit inside the plant premises 80 $\mu\text{g}/\text{m}^3$ for industrial area.

CO: The maximum value for CO observed at AHP area as 0.337 mg/m^3 and minimum value for CO at BTG plant as 0.205 mg/m^3 . The 8 hours applicable limit inside the plant premises 02 mg/m^3 for industrial area.

Ammonia: The maximum and minimum value for Ammonia observed at all the locations as <20 $\mu\text{g}/\text{m}^3$. The 24 hours' applicable limit inside the plant premises 400 $\mu\text{g}/\text{m}^3$ for industrial area

Nickel: The maximum value for Nickel observed at CHP area as 2.5 ng/m^3 and <1.0 ng/m^3 minimum value for BTG, DM, CHP & AHP Plant area. The 24 hours' applicable limit inside the plant premises 20 ng/m^3 for industrial area.


Arsenic: The maximum and minimum value for Arsenic observed at all the locations as <1.0 ng/m^3 . The 24 hours applicable limit inside the plant premises 6 ng/m^3 for industrial area

Lead: The maximum value for Lead observed at AHP area as 0.006 $\mu\text{g}/\text{m}^3$ and minimum value for BTG, DM, CHP & AHP Plant area as <0.001 $\mu\text{g}/\text{m}^3$. The 24 hours' applicable limit inside the plant premises 1 $\mu\text{g}/\text{m}^3$ for industrial area.

Ozone: The maximum value for Ozone observed at CHP area as 14.6 $\mu\text{g}/\text{m}^3$ and minimum value for Ozone DM Plant area as 6.4 $\mu\text{g}/\text{m}^3$. The 8 hours' applicable limit inside the plant premises 100 $\mu\text{g}/\text{m}^3$ for industrial area.

Benzo(a)Pyrene: The maximum and minimum value for Benzo(a)Pyrene observed at all the locations as <0.1 ng/m^3 . The 24 hours applicable limit inside the plant premises 1 ng/m^3 for industrial area

Benzene: The maximum and minimum value for Benzene observed at all the locations as <1.0 $\mu\text{g}/\text{m}^3$. The 24 hours applicable limit inside the plant premises 5 $\mu\text{g}/\text{m}^3$ for industrial area

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Mercury: The maximum and minimum value for Mercury observed at all the locations as $<0.001 \mu\text{g} / \text{m}^3$ for 24 hours.

7.1.2 Observations (Outside the premises)

PM_{2.5}: The maximum value for PM_{2.5} observed at Tarod village as $34.8 \mu\text{g} / \text{m}^3$ and minimum value for PM_{2.5} at Sonsari village as $26.6 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $60 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

PM₁₀: The maximum value for PM₁₀ observed at Tarod village as $63.5 \mu\text{g} / \text{m}^3$ and minimum value for PM₁₀ at Nariyara village as $51.8 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $100 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

SO₂: The maximum value for SO₂ observed at Tarod village as $13.3 \mu\text{g} / \text{m}^3$ and minimum value for SO₂ at Sonsari village as $9.6 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the Plant premises $80 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

NO_x: The maximum value for NO_x observed at Tarod village as $16.1 \mu\text{g} / \text{m}^3$ and minimum value for NO_x at Amora village as $12.5 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $80 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

CO: The maximum value for CO observed at Tarod village as $0.229 \text{mg} / \text{m}^3$ and minimum value for CO at Amora village as $0.139 \text{mg} / \text{m}^3$. The 8 hours' applicable limit outside the plant premises $02 \text{mg} / \text{m}^3$ for Rural/Residential area.

Ammonia: The maximum and minimum value for Ammonia observed at all the locations as $<20 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $400 \mu\text{g} / \text{m}^3$ for Rural/Residential area.


Nickel: The maximum and minimum value for Nickel observed at all the locations as $<1.0 \text{ng} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $20 \text{ng} / \text{m}^3$ for Rural/Residential area.

Arsenic: The maximum and minimum value for Arsenic observed at all the locations as $<1.0 \text{ng} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $6 \text{ng} / \text{m}^3$ for Rural/Residential area

Lead: The maximum and minimum value for Lead observed at all the locations as $<0.001 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $1 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

Ozone: The maximum value for Ozone observed at Sonsari village as $8.6 \mu\text{g} / \text{m}^3$ and minimum value for Ozone at Jhalmala village as $4.8 \mu\text{g} / \text{m}^3$. The 8 hours applicable limit outside the plant premises $100 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

Benzo(a)Pyrene: The maximum and minimum value for Benzo(a)Pyrene observed at all the locations as $<0.1 \text{ng} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $1 \text{ng} / \text{m}^3$ for Rural/Residential area

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Benzene: The maximum and minimum value for Benzene observed at all the locations as $<1.0 \mu\text{g}/\text{m}^3$. The 24 hours applicable limit outside the plant premises $5 \mu\text{g}/\text{m}^3$ for Rural/Residential area

Mercury: The maximum and minimum value for Mercury observed at all the locations as $<0.001 \mu\text{g}/\text{m}^3$ for 24 hours.

7.1.2 Results and conclusions:

The results of the monitored data indicate that the ambient air quality of the region in general is conformity with respect to norms of National Ambient Air Quality standards of CPCB, at all locations monitored.

7.2 **Noise Monitoring**

7.2.1 Source Noise Monitoring – Inside the Plant Premises

The spot noise levels observed inside the premises at various locations is given in **Table-12**

TABLE-12
INDUSTRIAL NOISE LEVELS IN WORK ENVIRONMENT

Sr. No	Code	Location	Date of sampling	Noise Level L_{eq} [dB(A)]
1	N1	TG floor	11/04/2024	71.8
2	N2	Cooling tower#3	02/04/2024	64.3
3	N3	Main Gate	02/04/2024	70.4
4	N4	Boiler feed pump	11/04/2024	81.6
5	N5	Admin Building area	02/04/2024	53.9
6	N6	CHP Machine area	15/04/2024	80.7
7	N7	AHP area	11/04/2024	73.5
8	N8	Ash Silo area	11/04/2024	74.2
9	N9	CW Pump house	02/04/2024	82.0
10	N10	Compressor 1	15/04/2024	82.6
11	N11	Compressor 2	15/04/2024	83.3
12	N12	Compressor 3	15/04/2024	82.1
13	N13	Compressor 4	15/04/2024	83.7

7.2.1.1 Observations

The industrial noise levels within the premises at Work Zone area are observed to be in the range of 53.9 to 83.7 dB (A), which are within the prescribed limit of 85 dB (A).

7.2.3 Noise Monitoring – Outside the Premises

The statistical analysis is done for measured noise levels at four locations in the study area. The parameters are analyzed for L_{day} , L_{night} , and L_{dn} . The statistical analysis results are given in **Table-13**.

TABLE-13
AMBIENT NOISE LEVELS IN THE STUDY AREA

All the values are given in dB (A)

Code	Location	Date of sampling	L_{10}	L_{50}	L_{90}	L_{eq}	L_{day}	L_{night}	L_{dn}
N14	Banahill Village	03.04.2024	51.4	47.5	43.8	48.5	49.3	42.5	47.2
N15	Tarod Village	05.04.2024	55.3	51.4	47.7	52.4	53.2	43.5	50.8
N16	Rogda Village	09.04.2024	52.4	48.5	44.8	49.5	50.3	41.3	47.8
N17	Jhalmala Village	12.04.2024	53.7	49.8	46.1	50.8	51.6	42.7	48.3
N18	Nariyara Village	16.04.2024	50.8	46.9	43.2	47.9	48.7	42.6	46.1
N19	Sonsari Village	19.04.2024	52.5	48.6	44.9	49.6	50.4	41.9	48.5
N20	Amora Village	22.04.2024	54.2	50.3	46.6	51.3	52.1	42.6	49.6
N21	Arasmeta Village	24.04.2024	53.8	49.9	46.2	50.9	51.7	43.0	48.8

7.2.3.1 Observations

a) Day time Noise Levels (L_{day})

Residential Area

The daytime (L_{day}) noise levels are observed to be in the range of 53.2 dB (A) – 48.7 dB (A), which are within the prescribed limit of 55 dB (A).

b) Night time Noise Levels (L_{night})

Residential Area

The nighttime (L_{night}) noise levels were observed to be in the range of 43.5 dB (A) – 41.3 dB (A), which are within the prescribed limit of 45 dB (A).

7.3 Ground Water Quality

Four ground water samples were collected around Ash pond area and four ground water samples were collected at villages around the plant site and analyzed for various parameters. The analytical results are presented below in **Table-14** and **Table-15**.

TABLE-14
GROUND WATER QUALITY AROUND ASHPOND

Sr. No	Parameter	Units	GW1	GW2	GW3	GW4	Limits as per IS:10500
	Sampling season		Pre monsoon Season	Pre monsoon Season	Pre monsoon Season	Pre monsoon Season	
	Sampling date		17.04.2024	17.04.2024	17.04.2024	17.04.2024	
	Date of analysis		19.04.2024	19.04.2024	19.04.2024	19.04.2024	
1	pH	--	7.74	7.28	7.40	7.17	6.5 – 8.5 (NR)
2	Color	Hazen	8	7	6	9	5(15)
3	Taste	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Odour	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Conductivity	µs/cm	1267	1066	967	1130	\$
6	Turbidity	NTU	5	4	3	5	1(5)
7	Total Dissolved Solids	mg/l	842	702	628	744	500(2000)
8	Total Hardness as CaCO ₃	mg/l	384	323	312	331	200(600)
9	Total Alkalinity as CaCO ₃	mg/l	244.3	220.7	199.5	215.5	200(600)
10	Calcium as Ca ²⁺	mg/l	82.3	64.3	66.6	71.2	75(200)
11	Magnesium as Mg ²⁺	mg/l	43.4	39.5	35.4	37.3	30(100)
12	Residual Chlorine	mg/l	<0.2	<0.2	<0.2	<0.2	0.2(1)
13	Boron as B	mg/l	0.8	0.5	0.7	0.6	0.5(1)
14	Chloride as Cl ⁻	mg/l	198.3	165.4	151.7	179.3	250(1000)
15	Sulphate as SO ₄ ²⁺	mg/l	88.4	65.4	56.2	73.4	200(400)
16	Fluorides as F	mg/l	1.0	0.6	0.9	1.1	1.0(1.5)
17	Nitrate as NO ₃	mg/l	18.3	12.4	10.8	20.5	45(NR)
18	Sodium as Na ⁺	mg/l	105.7	86.4	73.0	98.2	\$
19	Potassium as K ⁺	mg/l	15.3	12.5	10.4	16.3	\$
20	Phenolic Compounds	mg/l	<0.001	<0.001	<0.001	<0.001	0.001(0.002)
21	Cyanides as CN	mg/l	<0.02	<0.02	<0.02	<0.02	0.05 (NR)
22	Anionic Detergents	mg/l	<0.1	<0.1	<0.1	<0.1	0.2 (1.0)
23	Mineral Oil	mg/l	<0.01	<0.01	<0.01	<0.01	0.5 (NR)
24	Cadmium as Cd	mg/l	<0.001	<0.001	<0.001	<0.001	0.003 (NR)
25	Total Arsenic as As	mg/l	<0.01	<0.01	<0.01	<0.01	0.01 (0.05)
26	Copper as Cu	mg/l	<0.01	<0.01	<0.01	<0.01	0.05 (1.5)
27	Lead as Pb	mg/l	<0.01	<0.01	<0.01	<0.01	0.01 (NR)
28	Manganese as Mn	mg/l	<0.01	<0.01	<0.01	<0.01	0.1 (0.3)
29	Iron as Fe	mg/l	0.10	0.08	0.05	0.07	0.3(NR)
30	Total Chromium (as Cr)	mg/l	<0.05	<0.05	<0.05	<0.05	0.05(NR)
31	Selenium as Se	mg/l	<0.01	<0.01	<0.01	<0.01	0.01(NR)
32	Zinc as Zn	mg/l	0.38	0.43	0.35	0.47	5(15)
33	Aluminium as Al	mg/l	<0.01	<0.01	<0.01	<0.01	0.03(0.2)
34	Mercury as Hg	mg/l	<0.001	<0.001	<0.001	<0.001	0.001(NR)
35	Pesticides	mg/l	Absent	Absent	Absent	Absent	Absent
36	E. Coli	--	Absent	Absent	Absent	Absent	Absent
37	Total Coliforms	MPN/100ml	Absent	Absent	Absent	Absent	10

Note: \$ - Limits not specified; NR - No Relaxation

Limits are shown in IS 10500 are Acceptable limits (Requirement) and in parenthesis are Permissible limit in absence of alternate source

Sampling Locations

GW1. Ash pond Location-1, GW2. Ash pond Location-2, GW3. Ash pond Location-3, GW4. Ash pond Location-4

7.3.1 Observations

7.3.2.1 Ground Water Quality

The analysis results indicate that the pH and conductivity of the ground water was found to be in the range of 7.17– 7.74 and 967 to 1267 µS/cm. The Total Dissolved Solids were found to be well within the limits ranging from 628 to 842 mg/L. Other parameters like Chlorides, Sulphates, Nitrates and Fluorides were observed to be well within the prescribed limits. The overall physico-chemical analysis of all the parameters is well within the standards as per IS: 10500.


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TABLE-15
GROUND WATER QUALITY IN STUDY AREA

Sr. No	Parameter	Units	GW1	GW2	GW3	GW4	Limits as per IS:10500
	Sampling season		Pre monsoon Season	Pre monsoon Season	Pre monsoon Season	Pre monsoon Season	
	Sampling date		16.04.2024	16.04.2024	16.04.2024	16.04.2024	
	Date of analysis		19.04.2024	19.04.2024	19.04.2024	19.04.2024	
1	pH	--	7.32	7.55	7.48	7.82	6.5 – 8.5 (NR)
2	Color	Hazen	1	1	1	1	5(15)
3	Taste	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Odour	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Conductivity	µs/cm	506	982	602	1617	\$
6	Turbidity	NTU	1	1	1	1	1(5)
7	Total Dissolved Solids	mg/l	323	638	385	1065	500(2000)
8	Total Hardness as CaCO ₃	mg/l	147	274	173	414	200(600)
9	Total Alkalinity as CaCO ₃	mg/l	112.5	257.8	108.3	309.4	200(600)
10	Calcium as Ca ²⁺	mg/l	33.8	72.7	40.7	120.5	75(200)
11	Magnesium as Mg ²⁺	mg/l	15.3	22.3	17.4	27.5	30(100)
12	Residual Chlorine	mg/l	<0.2	<0.2	<0.2	<0.2	0.2(1)
13	Boron as B	mg/l	0.04	0.03	0.02	0.07	0.5(1)
14	Chloride as Cl ⁻	mg/l	70.5	97.4	90.7	277.0	250(1000)
15	Sulphate as SO ₄ ²⁺	mg/l	28.4	80.5	52.3	85.3	200(400)
16	Fluorides as F	mg/l	0.6	0.4	0.5	0.7	1.0(1.5)
17	Nitrate as NO ₃	mg/l	11.7	13.4	9.9	18.4	45(NR)
18	Sodium as Na ⁺	mg/l	43.6	92.3	55.7	173.2	\$
19	Potassium as K ⁺	mg/l	8.4	13.5	5.6	13.5	\$
20	Phenolic Compounds	mg/l	<0.001	<0.001	<0.001	<0.001	0.001(0.002)
21	Cyanides as CN	mg/l	<0.02	<0.02	<0.02	<0.02	0.05 (NR)
22	Anionic Detergents	mg/l	<0.1	<0.1	<0.1	<0.1	0.2 (1.0)
23	Mineral Oil	mg/l	<0.01	<0.01	<0.01	<0.01	0.5 (NR)
24	Cadmium as Cd	mg/l	<0.001	<0.001	<0.001	<0.001	0.003 (NR)
25	Total Arsenic as As	mg/l	<0.01	<0.01	<0.01	<0.01	0.01 (0.05)
26	Copper as Cu	mg/l	<0.01	<0.01	<0.01	<0.01	0.05 (1.5)
27	Lead as Pb	mg/l	<0.01	<0.01	<0.01	<0.01	0.01 (NR)
28	Manganese as Mn	mg/l	<0.01	<0.01	<0.01	<0.01	0.1 (0.3)
29	Iron as Fe	mg/l	0.04	0.11	0.06	0.15	0.3(NR)
30	Total Chromium (as Cr)	mg/l	<0.05	<0.05	<0.05	<0.05	0.05(NR)
31	Selenium as Se	mg/l	<0.01	<0.01	<0.01	<0.01	0.01(NR)
32	Zinc as Zn	mg/l	0.18	0.25	0.36	0.33	5(15)
33	Aluminium as Al	mg/l	<0.01	<0.01	<0.01	<0.01	0.03(0.2)
34	Mercury as Hg	mg/l	<0.001	<0.001	<0.001	<0.001	0.001(NR)
35	Pesticides	mg/l	Absent	Absent	Absent	Absent	Absent
36	E. Coli	--	Absent	Absent	Absent	Absent	Absent
37	Total Coliforms	MPN/100ml	Absent	Absent	Absent	Absent	10

Note: \$ - Limits not specified; NR - No Relaxation Limits are shown in IS 10500 are Acceptable limits (Requirement) and in parenthesis are Permissible limit in absence of alternate source

Sampling Locations

GW1. Amora Village (Bore well) , GW2. Rogda (Bore well)
GW3. Banahill (Bore well) , GW4. Nariyara Village (Bore well)

7.3.1 Observations

7.3.2.1 Ground Water Quality

The analysis results indicate that the pH and conductivity of the ground water was found to be in the range of 7.32 - 7.82 and 506 to 1617 µS/cm. The Total Dissolved Solids were found to be well within the limits ranging from 323 to 1065 mg/L. Other parameters like Chlorides, Sulphates, Nitrates and Fluorides were observed to be well with in the prescribed limits. The overall physico-chemical analysis of all the parameters is well with in the standards as per IS: 10500.

7.4 Waste Water Quality

Four waste water samples were collected within the plant site and analyzed for various parameters. The analytical results are presented below in **Table-16**.

TABLE-16
WASTE WATER QUALITY


Sr. No.	Parameters	Units	CT Blow Down	Boiler Blow Down	Condenser Cooling water	Guard Pond	Limits as per CECB& CPCB
			WW1	WW2	WW3	WW4	
	Sampling Date		17.04.2024	17.04.2024	17.04.2024	17.04.2024	
	Date of Analysis		19.04.2024	19.04.2024	19.04.2024	19.04.2024	
1	p ^H	-	7.66	8.12	8.32	7.60	6.5-8.5
	Temperature	°C	29.1	28.6	28.0	27.2	
3	Total Dissolved Solids	mg/l	682	5	4	552	-
4	Total Suspended Solids	mg/l	19.6	<1.0	<1.0	48.8	100
5	Dissolved Oxygen	mg/l	5.1	4.9	5.2	5.3	-
6	Biochemical Oxygen Demand, (3 days at 27°C)	mg/l	<3	<3	<3	<3	-
7	Chemical Oxygen Demand	mg/l	8	<5	<5	43	-
8	Chlorides	mg/l	98.6	8.8	13.4	154.8	-
9	Sulphates	mg/l	54.3	22.7	27.0	108.4	-
10	Phosphates	mg/l	0.71	<0.01	<0.01	0.64	5.0
11	Zinc	mg/l	0.05	<0.01	<0.01	0.35	1.0
12	Chromium	mg/l	<0.01	<0.01	<0.01	<0.01	0.2
13	Copper	mg/l	<0.01	<0.01	<0.01	<0.01	1.0
14	Free Available chlorine	mg/l	<0.2	<0.2	<0.2	<0.2	0.5
15	Irons	mg/l	<0.01	<0.01	<0.01	0.18	1.0
16	Oil & Grease	mg/l	<1.0	<1.0	<1.0	<1.0	20

7.4.1 Results and Conclusions

The data analysis to be as per CFO Norms and analytical results indicated that the guard pond waste water is well within the standard limits specified by EPA Notification [G.S.R.7, dt. Dec.22,1998].

7.4.2 Observations-Waste water quality.

The analysis results indicate that the pH ranges from 7.66 – 8.32 and the Total Suspended Solids were found to be within the limits ranging from <1.0-48.8 mg/l. Other parameters like Zinc, Chromium, Available, chloride, Iron and Oil& Grease were observed to be well within the prescribed limits.

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7.4.3 Sewage Waste Water Quality

One Sewage water samples is collected and analyzed for various parameters. The survey analytical results are given in **Table-17**.

TABLE-17
SEWAGE WASTE WATER QUALITY


Sr.No	Parameter	UOM	WW5 (STP Outlet)
	Sampling Date		17.04.2024
	Date of Analysis		19.04.2024
1	pH	-	7.52
2	Total Dissolved Solids	mg/l	506
3	Total Suspended Solids	mg/l	33.6
4	Dissolved Oxygen	mg/l	5.2
5	Bio Chemical Oxygen Demand for 3 day 27°C	mg/l	<1.0
6	Chemical Oxygen Demand	mg/l	17
7	Chlorides	mg/l	63
8	Sulphates	mg/l	126.2
9	Phosphates	mg/l	0.63
10	Zinc	mg/l	0.32
11	Chromium	mg/l	<0.01
12	Copper	mg/l	<0.01
13	Available Chlorine	mg/l	<0.2
14	Iron	mg/l	0.18
15	Oil and Grease	mg/l	<1.0

7.5 Water Depth measurement

Four ground water depths at villages and plant and four ash pond area locations were measured and results are given in **Table-18**.

TABLE-18
WATER DEPTH MEASUREMENT

Location Code	Location Name	Depth(m)
BW1	Banahil Village	5.04
OW1	Nariyara Village	4.03
OW2	Amora Village	3.66
OW3	Rogda Village	4.88
ASH1	Ash pond Location-1	9.73
ASH2	Ash pond Location-2	8.83
ASH3	Ash pond Location-3	8.52
ASH4	Ash pond Location-4	3.70

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7.7 Stack Emission Monitoring

The power plant has stack of height 275.0-m, which is the major source of air pollution. The stack emission monitoring for Unit-II, Unit-III and Unit - IV has been carried out and results are given in **Table-21 to Table-23**.

TABLE-21
STACK EMISSION MONITORING UNIT -II

Sr. No.	Parameters	UOM	Result	Methods
Date Of Sampling : 26/04/2024				
Sampling Time : 11.30 to 12.30 hrs				
Duration Of sampling : 60 mints				
Date of sample analysis : 29/04/2024				
Details of the source				
1	Capacity	MW	600	-
2	Stack Height	M	275	-
3	Duct Dimension	M	7.0	-
4	Duct area	m ²	38	-
Flue Gas Characteristics				
5	Temperature	°C	114	USEPA 1,2,3&4
6	Velocity	m/s	21.44	USEPA 1,2,3&4
7	Volumetric Flow Rate	Nm ³ /s	603.41	USEPA 1,2,3&4
8	Particulate Matter	mg/Nm ³	25.6	USEPA 5
9	Sulfur dioxide	mg/Nm ³	805	USEPA 6
10	Oxides of Nitrogen	mg/Nm ³	387	USEPA 7
11	Arsenic as As	mg/Nm ³	0.034	USEPA method -29
12	Cadmium as Cd	mg/Nm ³	0.041	USEPA method -29
13	Cobalt as Co	mg/Nm ³	<0.001	USEPA method -29
14	Nickel as Ni	mg/Nm ³	0.046	USEPA method -29
15	Copper as Cu	mg/Nm ³	0.057	USEPA method -29
16	Mercury as Hg	mg/Nm ³	0.013	USEPA method -29
17	Chromium as Cr	mg/Nm ³	0.027	USEPA method -29
18	Manganese as Mn	mg/Nm ³	0.032	USEPA method -29
19	Antimony as Sb	mg/Nm ³	<0.001	USEPA method -29
20	Lead as Pb	mg/Nm ³	0.035	USEPA method -29
21	Thallium as TI	mg/Nm ³	<0.001	USEPA method -29
22	Vanadium as V	mg/Nm ³	<0.001	USEPA method -29

The results indicate that the PM is observed as 25.6 mg/Nm³.


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TABLE-22
STACK EMISSION MONITORING UNIT -III

Sr. No.	Parameters	UOM	Result	Methods
Date Of Sampling : 27/04/2024				
Sampling Time : 11.00 to 12.00 hrs				
Duration Of sampling : 60 mints				
Date of sample analysis : 29/04/2024				
Details of the source				
1	Capacity	MW	600	-
2	Stack Height	M	275	-
3	Duct Dimension	M	7.0	-
4	Duct area	m ²	38	-
Flue Gas Characteristics				
5	Temperature	°C	126	USEPA 1,2,3&4
6	Velocity	m/s	22.60	USEPA 1,2,3&4
7	Volumetric Flow Rate	Nm ³ /s	616.59	USEPA 1,2,3&4
8	Particulate Matter	mg/Nm ³	8.45	USEPA 5
9	Sulfur dioxide	mg/Nm ³	783	USEPA 6
10	Oxides of Nitrogen	mg/Nm ³	406	USEPA 7
11	Arsenic as As	mg/Nm ³	0.024	USEPA method -29
12	Cadmium as Cd	mg/Nm ³	0.018	USEPA method -29
13	Cobalt as Co	mg/Nm ³	<0.001	USEPA method -29
14	Nickel as Ni	mg/Nm ³	0.041	USEPA method -29
15	Copper as Cu	mg/Nm ³	0.047	USEPA method -29
16	Mercury as Hg	mg/Nm ³	0.009	USEPA method -29
17	Chromium as Cr	mg/Nm ³	0.019	USEPA method -29
18	Manganese as Mn	mg/Nm ³	0.038	USEPA method -29
19	Antimony as Sb	mg/Nm ³	<0.001	USEPA method -29
20	Lead as Pb	mg/Nm ³	0.027	USEPA method -29
21	Thallium as TI	mg/Nm ³	<0.001	USEPA method -29
22	Vanadium as V	mg/Nm ³	<0.001	USEPA method -29

The results indicate that the PM is observed as 8.45 mg/Nm³.


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TABLE-23
STACK EMISSION MONITORING UNIT -IV

Sr. No.	Parameters	UOM	Result	Methods
Date Of Sampling : 25/04/2024				
Sampling Time : 15.00 to 16.00 hrs				
Duration Of sampling : 60 mints				
Date of sample analysis : 29/04/2024				
Details of the source				
1	Capacity	MW	600	-
2	Stack Height	M	275	-
3	Duct Dimension	M	7.0	-
4	Duct area	m ²	38	-
Flue Gas Characteristics				
5	Temperature	°C	123	USEPA 1,2,3&4
6	Velocity	m/s	22.06	USEPA 1,2,3&4
7	Volumetric Flow Rate	Nm ³ /s	621.54	USEPA 1,2,3&4
8	Particulate Matter	mg/Nm ³	12.64	USEPA 5
9	Sulfur dioxide	mg/Nm ³	856	USEPA 6
10	Oxides of Nitrogen	mg/Nm ³	398	USEPA 7
11	Arsenic as As	mg/Nm ³	0.029	USEPA method -29
12	Cadmium as Cd	mg/Nm ³	0.035	USEPA method -29
13	Cobalt as Co	mg/Nm ³	<0.001	USEPA method -29
14	Nickel as Ni	mg/Nm ³	0.031	USEPA method -29
15	Copper as Cu	mg/Nm ³	0.045	USEPA method -29
16	Mercury as Hg	mg/Nm ³	0.008	USEPA method -29
17	Chromium as Cr	mg/Nm ³	0.025	USEPA method -29
18	Manganese as Mn	mg/Nm ³	0.034	USEPA method -29
19	Antimony as Sb	mg/Nm ³	<0.001	USEPA method -29
20	Lead as Pb	mg/Nm ³	0.032	USEPA method -29
21	Thallium as TI	mg/Nm ³	<0.001	USEPA method -29
22	Vanadium as V	mg/Nm ³	<0.001	USEPA method -29

The results indicate that the PM is observed as 12.64 mg/Nm³.

ENVIRONMENTAL MONITORING REPORT
FOR
6x600 MW COAL BASED POWER PLANT
OF KSK MAHANADI POWER COMPANY LTD
AT NARIYARA, JANJGIR-CHAMPA DISTRICT, CHHATTISGARH

MONTHLY REPORT: MAY-2024


Client:

KSK Mahanadi Power Company Ltd
Nariyara, Chhattisgarh

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6.0 QUALITY ASSURANCE

Vimta Labs Ltd is accredited by NABL Govt. of India and follows quality systems as per ISO/IEC 17025-2017. The QA/QC procedures are laid prior to sample collection and laboratory analysis. It includes the standard procedures of sample collection, preservation, transportation and laboratory analysis with all documented procedures and continuous monitoring of Quality Control division.

7.0 RESULTS OF SURVEY DATA

The monitoring results of Ambient Air Quality analysis for the month of **May-2024** are presented in below **Table-6 to Table-10**.

7.1 Ambient Air Quality Monitoring Results

TABLE-6
AAQ MONITORING RESULTS

Monitoring Date	PM2.5	PM10	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³
	Particulate Matter(µg/m ³)				
BTG area – AAQ1					
03.05.2024	34.6	67.6	13.8	17.1	0.269
07.05.2024	37.4	59.3	12.7	15.0	0.221
10.05.2024	41.7	60.7	15.2	13.5	0.246
14.05.2024	35.6	64.8	14.0	16.5	0.258
17.05.2024	42.5	58.8	13.2	15.3	0.272
21.05.2024	41.3	66.2	14.5	16.8	0.222
24.05.2024	42.4	68.8	12.5	12.7	0.257
28.05.2024	35.8	59.4	13.2	17.0	0.210
Max	42.5	68.8	15.2	17.1	0.272
Min	34.6	58.8	12.5	12.7	0.210
Avg	38.9	63.2	13.6	15.5	0.244
98%ile	42.5	68.6	15.1	17.1	0.272
CHP area – AAQ2					
03.05.2024	42.5	68.3	13.2	17.4	0.256
07.05.2024	39.0	74.6	16.3	18.3	0.273
10.05.2024	45.2	71.1	13.9	15.4	0.299
14.05.2024	38.4	68.7	15.0	17.0	0.304
17.05.2024	41.8	71.4	14.4	15.6	0.284
21.05.2024	38.7	67.9	13.5	17.5	0.243
24.05.2024	40.6	74.5	15.6	17.2	0.272
28.05.2024	43.6	70.8	13.4	15.1	0.258
Max	45.2	74.6	16.3	18.3	0.304
Min	38.4	67.9	13.2	15.1	0.243
Avg	41.2	70.9	14.4	16.7	0.274
98%ile	45.0	74.6	16.2	18.2	0.303
Limits as per NAAQS	60	100	80	80	02
Test Methods	Gravimetric Method		Improved West & Geake Method	Modified Jacob & Hochheiser Method	NDIR spectroscopy method

Teflon filter paper was used in PM2.5 & whatman filter paper for PM10 weighed in Mettler electronic balance and computed as per standard methods PM2.5, PM10, SO₂, NO_x is monitored on 24 hrs. Basis CO is monitored on 8 hours basis All the values are expressed in µg/m³ except CO is measured in mg/m³


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TABLE-7
AAQ MONITORING RESULTS

Monitoring Date	PM2.5	PM10	SO ₂	NO ₂	CO
	Particulate Matter(µg/m ³)		µg/m ³	µg/m ³	mg/m ³
DM plant area – AAQ3					
03.05.2024	39.1	58.3	12.6	14.7	0.225
07.05.2024	32.6	61.4	13.0	12.6	0.220
10.05.2024	35.5	55.6	12.0	14.0	0.212
14.05.2024	39.2	63.4	12.8	15.2	0.210
17.05.2024	38.3	60.2	13.5	13.4	0.259
21.05.2024	37.5	58.1	12.8	14.3	0.215
24.05.2024	40.5	63.5	14.1	15.6	0.208
28.05.2024	36.5	60.3	11.7	13.9	0.241
Max	40.5	63.5	14.1	15.6	0.259
Min	32.6	55.6	11.7	12.6	0.208
Avg	37.4	60.1	12.8	14.2	0.224
98%ile	40.3	63.5	14.0	15.5	0.256
Ash handling area – AAQ4					
03.05.2024	41.5	68.5	13.3	15.7	0.308
07.05.2024	39.5	73.4	14.0	17.2	0.284
10.05.2024	42.2	75.8	13.5	16.2	0.270
14.05.2024	38.4	62.4	15.9	17.4	0.319
17.05.2024	43.7	76.4	13.7	15.5	0.274
21.05.2024	40.3	67.9	14.4	17.7	0.285
24.05.2024	44.7	72.7	15.3	16.1	0.298
28.05.2024	42.8	74.3	13.5	15.7	0.268
Max	44.7	76.4	15.9	17.7	0.319
Min	38.4	62.4	13.3	15.5	0.268
Avg	41.6	71.4	14.2	16.4	0.288
98%ile	44.6	76.3	15.8	17.7	0.317
Tarod Village – AAQ5					
03.05.2024	30.9	59.1	12.6	15.1	0.198
07.05.2024	32.1	61.2	11.7	14.3	0.176
10.05.2024	27.2	63.6	10.5	13.4	0.203
14.05.2024	35.0	56.5	12.1	15.0	0.168
17.05.2024	28.4	65.3	13.0	14.8	0.202
21.05.2024	36.7	57.8	10.3	13.2	0.214
24.05.2024	27.3	58.0	11.5	15.4	0.197
28.05.2024	35.8	60.0	11.7	14.4	0.187
Max	36.7	65.3	13.0	15.4	0.214
Min	27.2	56.5	10.3	13.2	0.168
Avg	31.7	60.2	11.7	14.5	0.193
98%ile	36.6	65.1	12.9	15.4	0.212
Jhalmala Village- AAQ6					
03.05.2024	32.6	57.2	11.3	13.5	0.156
07.05.2024	29.4	53.5	10.4	12.9	0.183
10.05.2024	30.7	54.5	12.2	14.1	0.172
14.05.2024	34.2	50.7	11.8	13.5	0.166
17.05.2024	31.6	56.5	10.4	12.8	0.147
21.05.2024	29.7	51.0	10.8	13.2	0.155
24.05.2024	27.1	58.6	12.1	14.0	0.193
28.05.2024	33.8	52.1	11.5	12.0	0.171
Max	34.2	58.6	12.2	14.1	0.193
Min	27.1	50.7	10.4	12.0	0.147
Avg	31.1	54.3	11.3	13.3	0.168
98%ile	34.1	58.4	12.2	14.1	0.192
Limits as per NAAQS	60	100	80	80	02


 KSK Power from knowledge	Monthly Environmental Monitoring Report for 6x600 MW Coal Based Power Plant of KSK Mahanadi Power Company Limited at Nariyara Village, Janjgir-Champa District, Chhattisgarh <div style="text-align: right;">May 2024</div>
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TABLE-8
AAQ MONITORING RESULTS

Monitoring Date	PM2.5	PM10	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³
	Particulate				
Amora Village - AAQ7					
03.05.2024	31.4	60.3	10.8	12.9	0.126
07.05.2024	30.7	55.8	12.9	14.4	0.153
10.05.2024	27.6	53.5	11.5	11.8	0.135
14.05.2024	34.0	56.2	13.6	15.3	0.156
17.05.2024	27.5	55.3	10.4	12.3	0.169
21.05.2024	33.2	58.4	13.3	15.1	0.143
24.05.2024	25.8	56.2	10.5	11.2	0.181
28.05.2024	29.4	60.8	11.6	15.6	0.143
Max	34.0	60.8	13.6	15.6	0.181
Min	25.8	53.5	10.4	11.2	0.126
Avg	30.0	57.1	11.8	13.6	0.151
98%ile	33.9	60.7	13.6	15.6	0.179
Sonsari Village - AAQ8					
03.05.2024	35.2	57.3	12.2	12.8	0.163
07.05.2024	28.9	63.3	10.9	14.3	0.158
10.05.2024	29.5	56.4	9.5	11.6	0.138
14.05.2024	30.8	63.4	12.6	14.2	0.166
17.05.2024	32.3	55.2	11.2	13.4	0.154
21.05.2024	34.0	62.5	12.8	14.6	0.161
24.05.2024	28.6	50.0	9.3	11.3	0.140
28.05.2024	36.0	62.0	13.0	15.1	0.160
Max	36.0	63.4	13.0	15.1	0.166
Min	28.6	50.0	9.3	11.3	0.138
Avg	31.9	58.8	11.4	13.4	0.155
98%ile	35.9	63.4	13.0	15.0	0.166
Nariyara Village – AAQ9					
03.05.2024	27.5	55.0	12.5	14.2	0.187
07.05.2024	30.5	54.1	10.4	12.8	0.147
10.05.2024	25.2	59.6	11.9	13.9	0.160
14.05.2024	32.9	52.2	12.2	14.5	0.188
17.05.2024	30.5	60.5	11.3	12.6	0.171
21.05.2024	33.5	49.6	10.2	14.1	0.185
24.05.2024	28.6	58.8	12.6	14.8	0.170
28.05.2024	32.7	55.7	11.2	13.5	0.157
Max	33.5	60.5	12.6	14.8	0.188
Min	25.2	49.6	10.2	12.6	0.147
Avg	30.2	55.7	11.5	13.8	0.171
98%ile	33.4	60.4	12.6	14.8	0.188
Limits as per NAAQS	60	100	80	80	02

Teflon filter paper was used in PM2.5 & whatman filter paper for PM10 weighed in Mettler electronic balance and computed as per standard methods PM2.5, PM10, SO₂, NO_x is monitored on 24 hrs. Basis CO is monitored on 8 hours basis All the values are expressed in µg/m³ except CO is measured in mg/m³


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TABLE-9
AAQ MONITORING RESULTS

Monitoring Date & Location	Arsenic ng/m ³	Nickel ng/m ³	Lead µg/m ³	O ₃ µg/m ³	NH ₃ µg/m ³	C ₆ H ₆ µg/m ³	Benzo(a) Pyrene ng/m ³	Hg µg/m ³
BTG area – AAQ1								
03.05.2024	<1.0	2.1	0.003	10.4	<20	<1.0	<0.1	<0.001
07.05.2024	<1.0	<1.0	<0.001	9.2	<20	<1.0	<0.1	<0.001
10.05.2024	<1.0	1.3	0.002	10.5	<20	<1.0	<0.1	<0.001
14.05.2024	<1.0	2.3	0.004	12.1	<20	<1.0	<0.1	<0.001
17.05.2024	<1.0	1.6	0.002	9.8	<20	<1.0	<0.1	<0.001
21.05.2024	<1.0	2.3	0.001	12.1	<20	<1.0	<0.1	<0.001
24.05.2024	<1.0	<1.0	<0.001	8.4	<20	<1.0	<0.1	<0.001
28.05.2024	<1.0	2.1	0.001	10.4	<20	<1.0	<0.1	<0.001
Max	<1.0	2.3	0.004	12.1	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	8.4	<20	<1.0	<0.1	<0.001
Avg	<1.0	2.0	0.002	10.4	<20	<1.0	<0.1	<0.001
98%	<1.0	2.3	0.004	12.1	<20	<1.0	<0.1	<0.001
CHP area – AAQ2								
03.05.2024	<1.0	1.3	0.004	11.8	<20	<1.0	<0.1	<0.001
07.05.2024	<1.0	<1.0	0.002	9.8	<20	<1.0	<0.1	<0.001
10.05.2024	<1.0	2.1	<0.001	13.6	<20	<1.0	<0.1	<0.001
14.05.2024	<1.0	2.8	0.003	10.2	<20	<1.0	<0.1	<0.001
17.05.2024	<1.0	2.4	<0.001	11.7	<20	<1.0	<0.1	<0.001
21.05.2024	<1.0	1.8	0.003	12.1	<20	<1.0	<0.1	<0.001
24.05.2024	<1.0	2.2	0.006	13.6	<20	<1.0	<0.1	<0.001
28.05.2024	<1.0	1.5	0.002	11.3	<20	<1.0	<0.1	<0.001
Max	<1.0	2.8	0.006	13.6	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	9.8	<20	<1.0	<0.1	<0.001
Avg	<1.0	2.0	0.003	11.8	<20	<1.0	<0.1	<0.001
98%ile	<1.0	2.8	0.006	13.6	<20	<1.0	<0.1	<0.001
DM plant area – AAQ3								
03.05.2024	<1.0	1.2	0.002	11.4	<20	<1.0	<0.1	<0.001
07.05.2024	<1.0	2.1	<0.001	9.5	<20	<1.0	<0.1	<0.001
10.05.2024	<1.0	<1.0	0.001	11.6	<20	<1.0	<0.1	<0.001
14.05.2024	<1.0	2.1	<0.001	8.7	<20	<1.0	<0.1	<0.001
17.05.2024	<1.0	1.5	0.003	10.2	<20	<1.0	<0.1	<0.001
21.05.2024	<1.0	1.2	0.001	11.8	<20	<1.0	<0.1	<0.001
24.05.2024	<1.0	<1.0	<0.001	8.5	<20	<1.0	<0.1	<0.001
28.05.2024	<1.0	1.8	0.003	9.8	<20	<1.0	<0.1	<0.001
Max	<1.0	2.1	0.003	11.8	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	8.5	<20	<1.0	<0.1	<0.001
Avg	<1.0	1.6	0.002	10.2	<20	<1.0	<0.1	<0.001
98%	<1.0	2.1	0.003	11.8	<20	<1.0	<0.1	<0.001

Below Detectable Limit for as and Ni 1.0 ng/m³ Below Detectable Limit for Pb 0.001 µg/m³ Ozone and CO is monitored on 8 hours basis Below Detectable Limit for O₃ 50 µg/m³ Below Detectable Limit for NH₃ 20 µg/m³


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TABLE-10
AAQ MONITORING RESULTS

Monitoring Date & Location	Arsenic ng/m ³	Nickel ng/m ³	Lead µg/m ³	O ₃ µg/m ³	NH ₃ µg/m ³	C ₆ H ₆ µg/m ³	Benzo(a) Pyrene ng/m ³	Hg µg/m ³
Ash handling area – AAQ4								
03.05.2024	<1.0	2.3	<0.001	14.2	<20	<1.0	<0.1	<0.001
07.05.2024	<1.0	2.0	0.005	11.4	<20	<1.0	<0.1	<0.001
10.05.2024	<1.0	1.5	0.002	9.7	<20	<1.0	<0.1	<0.001
14.05.2024	<1.0	<1.0	<0.001	13.2	<20	<1.0	<0.1	<0.001
17.05.2024	<1.0	1.5	0.004	10.9	<20	<1.0	<0.1	<0.001
21.05.2024	<1.0	1.8	0.003	11.5	<20	<1.0	<0.1	<0.001
24.05.2024	<1.0	2.2	0.001	12.4	<20	<1.0	<0.1	<0.001
28.05.2024	<1.0	1.4	0.003	13.4	<20	<1.0	<0.1	<0.001
Max	<1.0	2.3	0.005	14.2	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	9.7	<20	<1.0	<0.1	<0.001
Avg	<1.0	1.8	0.003	12.1	<20	<1.0	<0.1	<0.001
98%	<1.0	2.3	0.005	14.1	<20	<1.0	<0.1	<0.001
Tarod Village – AAQ5								
03.05.2024	<1.0	<1.0	<0.001	6.2	<20	<1.0	<0.1	<0.001
07.05.2024	<1.0	<1.0	<0.001	7.6	<20	<1.0	<0.1	<0.001
10.05.2024	<1.0	<1.0	<0.001	8.4	<20	<1.0	<0.1	<0.001
14.05.2024	<1.0	<1.0	<0.001	7.3	<20	<1.0	<0.1	<0.001
17.05.2024	<1.0	<1.0	<0.001	6.6	<20	<1.0	<0.1	<0.001
21.05.2024	<1.0	<1.0	<0.001	7.8	<20	<1.0	<0.1	<0.001
24.05.2024	<1.0	<1.0	<0.001	6.7	<20	<1.0	<0.1	<0.001
28.05.2024	<1.0	<1.0	<0.001	8.4	<20	<1.0	<0.1	<0.001
Max	<1.0	<1.0	<0.001	8.4	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	6.2	<20	<1.0	<0.1	<0.001
Avg	<1.0	<1.0	<0.001	7.4	<20	<1.0	<0.1	<0.001
98%	<1.0	<1.0	<0.001	8.4	<20	<1.0	<0.1	<0.001
Jhalmala Village- AAQ-6								
03.05.2024	<1.0	<1.0	<0.001	5.6	<20	<1.0	<0.1	<0.001
07.05.2024	<1.0	<1.0	<0.001	6.1	<20	<1.0	<0.1	<0.001
10.05.2024	<1.0	<1.0	<0.001	5.3	<20	<1.0	<0.1	<0.001
14.05.2024	<1.0	<1.0	<0.001	6.5	<20	<1.0	<0.1	<0.001
17.05.2024	<1.0	<1.0	<0.001	5.6	<20	<1.0	<0.1	<0.001
21.05.2024	<1.0	<1.0	<0.001	4.9	<20	<1.0	<0.1	<0.001
24.05.2024	<1.0	<1.0	<0.001	6.2	<20	<1.0	<0.1	<0.001
28.05.2024	<1.0	<1.0	<0.001	5.9	<20	<1.0	<0.1	<0.001
Max	<1.0	<1.0	<0.001	6.5	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	4.9	<20	<1.0	<0.1	<0.001
Avg	<1.0	<1.0	<0.001	5.8	<20	<1.0	<0.1	<0.001
98%	<1.0	<1.0	<0.001	6.5	<20	<1.0	<0.1	<0.001
Limits as per	06	20	1.0	100	400	05	01	-

Below Detectable Limit for as and Ni 1.0 ng/m³, Below Detectable Limit for Pb 0.001 µg/m³ Ozone and CO is monitored on 8 hours basis Below Detectable Limit for O₃ 50 µg/m³ Below Detectable Limit for NH₃ 20 µg/m³



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TABLE-11
AAQ MONITORING RESULTS

Monitoring Date & Location	Arsenic ng/m ³	Nickel ng/m ³	Lead µg/m ³	O ₃ µg/m ³	NH ₃ µg/m ³	C ₆ H ₆ µg/m ³	Benzo(a) Pyrene ng/m ³	Hg µg/m ³
Amora Village – AAQ7								
03.05.2024	<1.0	<1.0	<0.001	7.1	<20	<1.0	<0.1	<0.001
07.05.2024	<1.0	<1.0	<0.001	6.3	<20	<1.0	<0.1	<0.001
10.05.2024	<1.0	<1.0	<0.001	7.4	<20	<1.0	<0.1	<0.001
14.05.2024	<1.0	<1.0	<0.001	4.6	<20	<1.0	<0.1	<0.001
17.05.2024	<1.0	<1.0	<0.001	7.3	<20	<1.0	<0.1	<0.001
21.05.2024	<1.0	<1.0	<0.001	5.7	<20	<1.0	<0.1	<0.001
24.05.2024	<1.0	<1.0	<0.001	6.1	<20	<1.0	<0.1	<0.001
28.05.2024	<1.0	<1.0	<0.001	5.0	<20	<1.0	<0.1	<0.001
Max	<1.0	<1.0	<0.001	7.4	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	4.6	<20	<1.0	<0.1	<0.001
Avg	<1.0	<1.0	<0.001	6.2	<20	<1.0	<0.1	<0.001
98%ile	<1.0	<1.0	<0.001	7.4	<20	<1.0	<0.1	<0.001
Sonsari Village – AAQ8								
03.05.2024	<1.0	<1.0	<0.001	5.9	<20	<1.0	<0.1	<0.001
07.05.2024	<1.0	<1.0	<0.001	7.2	<20	<1.0	<0.1	<0.001
10.05.2024	<1.0	<1.0	<0.001	6.7	<20	<1.0	<0.1	<0.001
14.05.2024	<1.0	<1.0	<0.001	5.8	<20	<1.0	<0.1	<0.001
17.05.2024	<1.0	<1.0	<0.001	6.8	<20	<1.0	<0.1	<0.001
21.05.2024	<1.0	<1.0	<0.001	4.9	<20	<1.0	<0.1	<0.001
24.05.2024	<1.0	<1.0	<0.001	6.1	<20	<1.0	<0.1	<0.001
28.05.2024	<1.0	<1.0	<0.001	8.0	<20	<1.0	<0.1	<0.001
Max	<1.0	<1.0	<0.001	8.0	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	4.9	<20	<1.0	<0.1	<0.001
Avg	<1.0	<1.0	<0.001	6.4	<20	<1.0	<0.1	<0.001
98%	<1.0	<1.0	<0.001	7.9	<20	<1.0	<0.1	<0.001
Nariyara Village – AAQ9								
03.05.2024	<1.0	<1.0	<0.001	6.5	<20	<1.0	<0.1	<0.001
07.05.2024	<1.0	<1.0	<0.001	7.5	<20	<1.0	<0.1	<0.001
10.05.2024	<1.0	<1.0	<0.001	6.6	<20	<1.0	<0.1	<0.001
14.05.2024	<1.0	<1.0	<0.001	7.3	<20	<1.0	<0.1	<0.001
17.05.2024	<1.0	<1.0	<0.001	6.4	<20	<1.0	<0.1	<0.001
21.05.2024	<1.0	<1.0	<0.001	7.1	<20	<1.0	<0.1	<0.001
24.05.2024	<1.0	<1.0	<0.001	6.6	<20	<1.0	<0.1	<0.001
28.05.2024	<1.0	<1.0	<0.001	7.4	<20	<1.0	<0.1	<0.001
Max	<1.0	<1.0	<0.001	7.5	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	6.4	<20	<1.0	<0.1	<0.001
Avg	<1.0	<1.0	<0.001	6.9	<20	<1.0	<0.1	<0.001
98%	<1.0	<1.0	<0.001	7.5	<20	<1.0	<0.1	<0.001
Limits as per NAAQS	06	20	1.0	100	400	05	01	-

Below Detectable Limit for as and Ni 1.0 ng/m³, Below Detectable Limit for Pb 0.001 µg/m³ Ozone and CO is monitored on 8 hours basis Below Detectable Limit for O₃ 50 µg/m³ Below Detectable Limit for NH₃ 20 µg/m³

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7.1.1 Observations (Inside the premises)

PM2.5: The maximum value for PM2.5 observed at CHP area as 45.2 $\mu\text{g}/\text{m}^3$ and minimum value for PM2.5 at DM plant area as 32.6 $\mu\text{g}/\text{m}^3$. The 24 hours applicable limit inside the plant premises 60 $\mu\text{g}/\text{m}^3$ for industrial area.

PM10: The maximum value for PM10 observed at AHP area as 76.4 $\mu\text{g}/\text{m}^3$ and minimum value for PM10 at DM Plant area as 55.6 $\mu\text{g}/\text{m}^3$. The 24 hours applicable limit inside the plant premises 100 $\mu\text{g}/\text{m}^3$ for industrial area.

SO₂: The maximum value for SO₂ observed at CHP plant area as 16.3 $\mu\text{g}/\text{m}^3$ and minimum value for SO₂ at DM Plant area as 11.7 $\mu\text{g}/\text{m}^3$. The 24 hours applicable limit inside the plant premises 80 $\mu\text{g}/\text{m}^3$ for industrial area.

NO₂: The maximum value for NO₂ observed at CHP area as 18.3 $\mu\text{g}/\text{m}^3$ and minimum value for NO₂ at DM Plant area as 12.6 $\mu\text{g}/\text{m}^3$. The 24 hours applicable limit inside the plant premises 80 $\mu\text{g}/\text{m}^3$ for industrial area.

CO: The maximum value for CO observed at AHP area as 0.319 mg/m^3 and minimum value for CO at DM plant as 0.208 mg/m^3 . The 8 hours applicable limit inside the plant premises 02 mg/m^3 for industrial area.

Ammonia: The maximum and minimum value for Ammonia observed at all the locations as <20 $\mu\text{g}/\text{m}^3$. The 24 hours' applicable limit inside the plant premises 400 $\mu\text{g}/\text{m}^3$ for industrial area

Nickel: The maximum value for Nickel observed at CHP area as 2.8 ng/m^3 and <1.0 ng/m^3 minimum value for BTG, DM, CHP & AHP Plant area. The 24 hours' applicable limit inside the plant premises 20 ng/m^3 for industrial area.

Arsenic: The maximum and minimum value for Arsenic observed at all the locations as <1.0 ng/m^3 . The 24 hours applicable limit inside the plant premises 6 ng/m^3 for industrial area

Lead: The maximum value for Lead observed at CHP area as 0.006 $\mu\text{g}/\text{m}^3$ and minimum value for BTG, DM, CHP & AHP Plant area as <0.001 $\mu\text{g}/\text{m}^3$. The 24 hours' applicable limit inside the plant premises 1 $\mu\text{g}/\text{m}^3$ for industrial area.

Ozone: The maximum value for Ozone observed at AHP area as 14.2 $\mu\text{g}/\text{m}^3$ and minimum value for Ozone DM Plant Plant area as 8.4 $\mu\text{g}/\text{m}^3$. The 8 hours' applicable limit inside the plant premises 100 $\mu\text{g}/\text{m}^3$ for industrial area.

Benzo(a)Pyrene: The maximum and minimum value for Benzo(a)Pyrene observed at all the locations as <0.1 ng/m^3 . The 24 hours applicable limit inside the plant premises 1 ng/m^3 for industrial area

Benzene: The maximum and minimum value for Benzene observed at all the locations as <1.0 $\mu\text{g}/\text{m}^3$. The 24 hours applicable limit inside the plant premises 5 $\mu\text{g}/\text{m}^3$ for industrial area

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Mercury: The maximum and minimum value for Mercury observed at all the locations as $<0.001 \mu\text{g} / \text{m}^3$ for 24 hours.

7.1.2 Observations (Outside the premises)

PM_{2.5}: The maximum value for PM_{2.5} observed at Tarod village as $36.7 \mu\text{g} / \text{m}^3$ and minimum value for PM_{2.5} at Nariyara village as $25.2 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $60 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

PM₁₀: The maximum value for PM₁₀ observed at Tarod village as $65.3 \mu\text{g} / \text{m}^3$ and minimum value for PM₁₀ at Nariyara village as $49.6 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $100 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

SO₂: The maximum value for SO₂ observed at Amora village as $13.6 \mu\text{g} / \text{m}^3$ and minimum value for SO₂ at Sonsari village as $9.3 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the Plant premises $80 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

NO_x: The maximum value for NO_x observed at Amora village as $15.6 \mu\text{g} / \text{m}^3$ and minimum value for NO_x at Amora village as $11.2 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $80 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

CO: The maximum value for CO observed at Tarod village as $0.214 \text{ mg} / \text{m}^3$ and minimum value for CO at Amora village as $0.126 \text{ mg} / \text{m}^3$. The 8 hours' applicable limit outside the plant premises $02 \text{ mg} / \text{m}^3$ for Rural/Residential area.

Ammonia: The maximum and minimum value for Ammonia observed at all the locations as $<20 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $400 \mu\text{g} / \text{m}^3$ for Rural/Residential area.


Nickel: The maximum and minimum value for Nickel observed at all the locations as $<1.0 \text{ ng} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $20 \text{ ng} / \text{m}^3$ for Rural/Residential area.

Arsenic: The maximum and minimum value for Arsenic observed at all the locations as $<1.0 \text{ ng} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $6 \text{ ng} / \text{m}^3$ for Rural/Residential area

Lead: The maximum and minimum value for Lead observed at all the locations as $<0.001 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $1 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

Ozone: The maximum value for Ozone observed at Tarod village as $8.4 \mu\text{g} / \text{m}^3$ and minimum value for Ozone at Amora village as $4.6 \mu\text{g} / \text{m}^3$. The 8 hours applicable limit outside the plant premises $100 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

Benzo(a)Pyrene: The maximum and minimum value for Benzo(a)Pyrene observed at all the locations as $<0.1 \text{ ng} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $1 \text{ ng} / \text{m}^3$ for Rural/Residential area

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Benzene: The maximum and minimum value for Benzene observed at all the locations as $<1.0 \mu\text{g}/\text{m}^3$. The 24 hours applicable limit outside the plant premises $5 \mu\text{g}/\text{m}^3$ for Rural/Residential area

Mercury: The maximum and minimum value for Mercury observed at all the locations as $<0.001 \mu\text{g}/\text{m}^3$ for 24 hours.

7.1.2 Results and conclusions:

The results of the monitored data indicate that the ambient air quality of the region in general is conformity with respect to norms of National Ambient Air Quality standards of CPCB, at all locations monitored.

7.2 **Noise Monitoring**

7.2.1 Source Noise Monitoring – Inside the Plant Premises

The spot noise levels observed inside the premises at various locations is given in **Table-12**

TABLE-12
INDUSTRIAL NOISE LEVELS IN WORK ENVIRONMENT

Sr. No	Code	Location	Date of sampling	Noise Level L_{eq} [dB(A)]
1	N1	TG floor	09/05/2024	72.4
2	N2	Cooling tower#3	06/05/2024	66.8
3	N3	Main Gate	06/05/2024	68.4
4	N4	Boiler feed pump	09/05/2024	82.0
5	N5	Admin Building area	06/05/2024	54.1
6	N6	CHP Machine area	13/05/2024	82.5
7	N7	AHP area	09/05/2024	71.2
8	N8	Ash Silo area	09/05/2024	72.7
9	N9	CW Pump house	06/05/2024	80.6
10	N10	Compressor 1	13/05/2024	83.1
11	N11	Compressor 2	13/05/2024	82.4
12	N12	Compressor 3	13/05/2024	83.2
13	N13	Compressor 4	13/05/2024	81.8

7.2.1.1 Observations

The industrial noise levels within the premises at Work Zone area are observed to be in the range of 54.1 to 83.2 dB (A), which are within the prescribed limit of 85 dB (A).

7.2.3 Noise Monitoring – Outside the Premises

The statistical analysis is done for measured noise levels at four locations in the study area. The parameters are analyzed for L_{day} , L_{night} , and L_{dn} . The statistical analysis results are given in **Table-13**.

TABLE-13
AMBIENT NOISE LEVELS IN THE STUDY AREA

All the values are given in dB (A)

Code	Location	Date of sampling	L_{10}	L_{50}	L_{90}	L_{eq}	L_{day}	L_{night}	L_{dn}
N14	Banahill Village	06.05.2024	53.2	49.3	45.6	50.3	51.1	41.5	48.6
N15	Tarod Village	02.05.2024	54.3	50.4	46.7	51.4	52.2	42.3	49.8
N16	Rogda Village	08.05.2024	50.6	46.7	43.0	47.7	48.5	40.7	46.1
N17	Jhalmala Village	10.05.2024	52.1	48.2	44.5	49.2	50.0	43.1	48.2
N18	Nariyara Village	14.05.2024	53.1	49.2	45.5	50.2	51.0	41.7	49.0
N19	Sonsari Village	16.05.2024	51.7	47.8	44.1	48.8	49.6	42.6	47.3
N20	Amora Village	22.05.2024	53.5	49.6	45.9	50.6	51.4	43.0	48.8
N21	Arasmata Village	20.05.2024	51.5	47.6	43.9	48.6	49.4	41.2	47.1

7.2.3.1 Observations

a) Day time Noise Levels (L_{day})

Residential Area

The daytime (L_{day}) noise levels are observed to be in the range of 52.2 dB (A) – 48.5 dB (A), which are within the prescribed limit of 55 dB (A).

b) Night time Noise Levels (L_{night})

Residential Area

The nighttime (L_{night}) noise levels were observed to be in the range of 43.1 dB (A) – 40.7 dB (A), which are within the prescribed limit of 45 dB (A).

7.3 Ground Water Quality

Four ground water samples were collected around Ash pond area and four ground water samples were collected at villages around the plant site and analyzed for various parameters. The analytical results are presented below in **Table-14** and **Table-15**.


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TABLE-14
GROUND WATER QUALITY AROUND ASHPOND

Sr. No	Parameter	Units	GW1	GW2	GW3	GW4	Limits as per IS:10500
	Sampling season		Pre monsoon Season	Pre monsoon Season	Pre monsoon Season	Pre monsoon Season	
	Sampling date		09.05.2024	09.05.2024	09.05.2024	09.05.2024	
	Date of analysis		11.05.2024	11.05.2024	11.05.2024	11.05.2024	
1	pH	--	7.06	7.32	7.51	7.28	6.5 – 8.5 (NR)
2	Color	Hazen	5	8	9	7	5(15)
3	Taste	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Odour	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Conductivity	µs/cm	817	937	1240	982	\$
6	Turbidity	NTU	4	5	4	3	1(5)
7	Total Dissolved Solids	mg/l	540	609	745	655	500(2000)
8	Total Hardness as CaCO ₃	mg/l	236	273	353	285	200(600)
9	Total Alkalinity as CaCO ₃	mg/l	170.2	180.5	254.4	190.6	200(600)
10	Calcium as Ca ²⁺	mg/l	52.4	63.6	75.0	68.8	75(200)
11	Magnesium as Mg ²⁺	mg/l	25.6	27.8	40.3	27.4	30(100)
12	Residual Chlorine	mg/l	<0.2	<0.2	<0.2	<0.2	0.2(1)
13	Boron as B	mg/l	0.6	0.4	0.5	0.3	0.5(1)
14	Chloride as Cl ⁻	mg/l	130.7	158.6	198.7	160.3	250(1000)
15	Sulphate as SO ₄ ²⁺	mg/l	42.3	52.4	64.8	60.4	200(400)
16	Fluorides as F	mg/l	0.5	0.7	1.1	0.9	1.0(1.5)
17	Nitrate as NO ₃	mg/l	10.5	9.7	14.4	11.1	45(NR)
18	Sodium as Na ⁺	mg/l	74.3	81.6	114.2	87.4	\$
19	Potassium as K ⁺	mg/l	8.4	9.3	14.7	12.8	\$
20	Phenolic Compounds	mg/l	<0.001	<0.001	<0.001	<0.001	0.001(0.002)
21	Cyanides as CN	mg/l	<0.02	<0.02	<0.02	<0.02	0.05 (NR)
22	Anionic Detergents	mg/l	<0.1	<0.1	<0.1	<0.1	0.2 (1.0)
23	Mineral Oil	mg/l	<0.01	<0.01	<0.01	<0.01	0.5 (NR)
24	Cadmium as Cd	mg/l	<0.001	<0.001	<0.001	<0.001	0.003 (NR)
25	Total Arsenic as As	mg/l	<0.01	<0.01	<0.01	<0.01	0.01 (0.05)
26	Copper as Cu	mg/l	<0.01	<0.01	<0.01	<0.01	0.05 (1.5)
27	Lead as Pb	mg/l	<0.01	<0.01	<0.01	<0.01	0.01 (NR)
28	Manganese as Mn	mg/l	<0.01	<0.01	<0.01	<0.01	0.1 (0.3)
29	Iron as Fe	mg/l	0.06	0.07	0.11	0.05	0.3(NR)
30	Total Chromium (as Cr)	mg/l	<0.05	<0.05	<0.05	<0.05	0.05(NR)
31	Selenium as Se	mg/l	<0.01	<0.01	<0.01	<0.01	0.01(NR)
32	Zinc as Zn	mg/l	0.41	0.38	0.45	0.33	5(15)
33	Aluminium as Al	mg/l	<0.01	<0.01	<0.01	<0.01	0.03(0.2)
34	Mercury as Hg	mg/l	<0.001	<0.001	<0.001	<0.001	0.001(NR)
35	Pesticides	mg/l	Absent	Absent	Absent	Absent	Absent
36	E. Coli	--	Absent	Absent	Absent	Absent	Absent
37	Total Coliforms	MPN/100ml	Absent	Absent	Absent	Absent	10

Note: \$ - Limits not specified; NR - No Relaxation

Limits are shown in IS 10500 are Acceptable limits (Requirement) and in parenthesis are Permissible limit in absence of alternate source

Sampling Locations

GW1. Ash pond Location-1, GW2. Ash pond Location-2, GW3. Ash pond Location-3, GW4. Ash pond Location-4

7.3.1 Observations

7.3.2.1 Ground Water Quality

The analysis results indicate that the pH and conductivity of the ground water was found to be in the range of 7.06– 7.51 and 817 to 1240 µS/cm. The Total Dissolved Solids were found to be well within the limits ranging from 540 to 745 mg/L. Other parameters like Chlorides, Sulphates, Nitrates and Fluorides were observed to be well within the prescribed limits. The overall physico-chemical analysis of all the parameters is well within the standards as per IS: 10500.


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TABLE-15
GROUND WATER QUALITY IN STUDY AREA

Sr. No	Parameter	Units	GW1	GW2	GW3	GW4	Limits as per IS:10500
	Sampling season		Pre monsoon Season	Pre monsoon Season	Pre monsoon Season	Pre monsoon Season	
	Sampling date		08.05.2024	08.05.2024	08.05.2024	08.05.2024	
	Date of analysis		10.05.2024	10.05.2024	10.05.2024	10.05.2024	
1	pH	--	7.03	6.94	7.22	7.08	6.5 – 8.5 (NR)
2	Color	Hazen	1	1	1	1	5(15)
3	Taste	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Odour	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Conductivity	µs/cm	602	835	495	1594	\$
6	Turbidity	NTU	1	1	1	1	1(5)
7	Total Dissolved Solids	mg/l	385	542	310	1052	500(2000)
8	Total Hardness as CaCO ₃	mg/l	177	250	144	394	200(600)
9	Total Alkalinity as CaCO ₃	mg/l	130.4	195.2	95.6	301.5	200(600)
10	Calcium as Ca ²⁺	mg/l	41.5	66.3	33.7	85.6	75(200)
11	Magnesium as Mg ²⁺	mg/l	17.9	20.5	14.4	43.7	30(100)
12	Residual Chlorine	mg/l	<0.2	<0.2	<0.2	<0.2	0.2(1)
13	Boron as B	mg/l	0.02	0.05	0.03	0.09	0.5(1)
14	Chloride as Cl ⁻	mg/l	79.4	95.6	73.5	271.7	250(1000)
15	Sulphate as SO ₄ ²⁺	mg/l	43.5	69.3	38.7	89.2	200(400)
16	Fluorides as F	mg/l	0.7	0.5	0.4	1.1	1.0(1.5)
17	Nitrate as NO ₃	mg/l	14.1	17.3	7.8	19.6	45(NR)
18	Sodium as Na ⁺	mg/l	52.7	71.6	45.9	176.9	\$
19	Potassium as K ⁺	mg/l	7.2	9.4	3.2	14.6	\$
20	Phenolic Compounds	mg/l	<0.001	<0.001	<0.001	<0.001	0.001(0.002)
21	Cyanides as CN	mg/l	<0.02	<0.02	<0.02	<0.02	0.05 (NR)
22	Anionic Detergents	mg/l	<0.1	<0.1	<0.1	<0.1	0.2 (1.0)
23	Mineral Oil	mg/l	<0.01	<0.01	<0.01	<0.01	0.5 (NR)
24	Cadmium as Cd	mg/l	<0.001	<0.001	<0.001	<0.001	0.003 (NR)
25	Total Arsenic as As	mg/l	<0.01	<0.01	<0.01	<0.01	0.01 (0.05)
26	Copper as Cu	mg/l	<0.01	<0.01	<0.01	<0.01	0.05 (1.5)
27	Lead as Pb	mg/l	<0.01	<0.01	<0.01	<0.01	0.01 (NR)
28	Manganese as Mn	mg/l	<0.01	<0.01	<0.01	<0.01	0.1 (0.3)
29	Iron as Fe	mg/l	0.03	0.05	0.04	0.10	0.3(NR)
30	Total Chromium (as Cr)	mg/l	<0.05	<0.05	<0.05	<0.05	0.05(NR)
31	Selenium as Se	mg/l	<0.01	<0.01	<0.01	<0.01	0.01(NR)
32	Zinc as Zn	mg/l	0.23	0.15	0.27	0.38	5(15)
33	Aluminium as Al	mg/l	<0.01	<0.01	<0.01	<0.01	0.03(0.2)
34	Mercury as Hg	mg/l	<0.001	<0.001	<0.001	<0.001	0.001(NR)
35	Pesticides	mg/l	Absent	Absent	Absent	Absent	Absent
36	E. Coli	--	Absent	Absent	Absent	Absent	Absent
37	Total Coliforms	MPN/100ml	Absent	Absent	Absent	Absent	10

Note: \$ - Limits not specified; NR - No Relaxation Limits are shown in IS 10500 are Acceptable limits (Requirement) and in parenthesis are Permissible limit in absence of alternate source

Sampling Locations

GW1. Amora Village (Bore well) , GW2. Rogda (Bore well)
GW3. Banahill (Bore well) , GW4. Nariyara Village (Bore well)

7.3.1 Observations

7.3.2.1 Ground Water Quality

The analysis results indicate that the pH and conductivity of the ground water was found to be in the range of 6.94 - 7.22 and 495 to 1594 µS/cm. The Total Dissolved Solids were found to be well within the limits ranging from 323 to 1065 mg/L. Other parameters like Chlorides, Sulphates, Nitrates and Fluorides were observed to be well with in the prescribed limits. The overall physico-chemical analysis of all the parameters is well with in the standards as per IS: 10500.

7.4 Waste Water Quality

Four waste water samples were collected within the plant site and analyzed for various parameters. The analytical results are presented below in **Table-16**.

TABLE-16
WASTE WATER QUALITY


Sr. No.	Parameters	Units	CT Blow Down	Boiler Blow Down	Condenser Cooling water	Guard Pond	Limits as per CECB&CPCB
			WW1	WW2	WW3	WW4	
	Sampling Date		09.05.2024	09.05.2024	09.05.2024	09.05.2024	
	Date of Analysis		11.05.2024	11.05.2024	11.05.2024	11.05.2024	
1	p ^H	-	7.45	8.02	8.13	7.52	6.5-8.5
	Temperature	°C	29.5	29.0	28.5	27.6	
3	Total Dissolved Solids	mg/l	633	7	5	603	-
4	Total Suspended Solids	mg/l	16.3	<1.0	<1.0	55.4	100
5	Dissolved Oxygen	mg/l	5.3	5.0	5.1	5.2	-
6	Biochemical Oxygen Demand, (3 days at 27°C)	mg/l	<3	<3	<3	<3	-
7	Chemical Oxygen Demand	mg/l	<5	<5	<5	38	-
8	Chlorides	mg/l	76.5	11.3	17.4	157.3	-
9	Sulphates	mg/l	64.5	26.7	32.5	93.4	-
10	Phosphates	mg/l	0.54	<0.01	<0.01	0.82	5.0
11	Zinc	mg/l	0.08	<0.01	<0.01	0.51	1.0
12	Chromium	mg/l	<0.01	<0.01	<0.01	<0.01	0.2
13	Copper	mg/l	<0.01	<0.01	<0.01	<0.01	1.0
14	Free Available chlorine	mg/l	<0.2	<0.2	<0.2	<0.2	0.5
15	Irons	mg/l	<0.01	<0.01	<0.01	0.23	1.0
16	Oil & Grease	mg/l	<1.0	<1.0	<1.0	<1.0	20

7.4.1 Results and Conclusions

The data analysis to be as per CFO Norms and analytical results indicated that the guard pond waste water is well within the standard limits specified by EPA Notification [G.S.R.7, dt. Dec.22,1998].

7.4.2 Observations-Waste water quality.

The analysis results indicate that the pH ranges from 7.45 – 8.13 and the Total Suspended Solids were found to be within the limits ranging from <1.0-55.4 mg/l. Other parameters like Zinc, Chromium, Available, chloride, Iron and Oil& Grease were observed to be well within the prescribed limits.

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7.4.3 Sewage Waste Water Quality

One Sewage water samples is collected and analyzed for various parameters. The survey analytical results are given in **Table-17**.

TABLE-17
SEWAGE WASTE WATER QUALITY


Sr.No	Parameter	UOM	WW5 (STP Outlet)
	Sampling Date		09.05.2024
	Date of Analysis		11.05.2024
1	pH	-	7.38
2	Total Dissolved Solids	mg/l	466
3	Total Suspended Solids	mg/l	27.4
4	Dissolved Oxygen	mg/l	5.0
5	Bio Chemical Oxygen Demand for 3 day 27°C	mg/l	<1.0
6	Chemical Oxygen Demand	mg/l	23
7	Chlorides	mg/l	75
8	Sulphates	mg/l	108.3
9	Phosphates	mg/l	0.46
10	Zinc	mg/l	0.38
11	Chromium	mg/l	<0.01
12	Copper	mg/l	<0.01
13	Available Chlorine	mg/l	<0.2
14	Iron	mg/l	0.22
15	Oil and Grease	mg/l	<1.0

7.5 Water Depth measurement

Four ground water depths at villages and plant and four ash pond area locations were measured and results are given in **Table-18**.

TABLE-18
WATER DEPTH MEASUREMENT

Location Code	Location Name	Depth(m)
BW1	Banahil Village	4.78
OW1	Nariyara Village	3.76
OW2	Amora Village	3.87
OW3	Rogda Village	5.23
ASH1	Ash pond Location-1	7.66
ASH2	Ash pond Location-2	9.14
ASH3	Ash pond Location-3	8.77
ASH4	Ash pond Location-4	4.32

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7.6 Stack Emission Monitoring

The power plant has stack of height 275.0-m, which is the major source of air pollution. The stack emission monitoring for Unit-II, Unit-III and Unit - IV has been carried out and results are given in **Table-19 to Table-21**.

TABLE-19
STACK EMISSION MONITORING UNIT -II

Sr. No.	Parameters	UOM	Result	Methods
Date Of Sampling : 29/05/2024				
Sampling Time : 15.00 to 14.00 hrs				
Duration Of sampling : 60 mints				
Date of sample analysis : 01/06/2024				
Details of the source				
1	Capacity	MW	600	-
2	Stack Height	M	275	-
3	Duct Dimension	M	7.0	-
4	Duct area	m ²	38	-
Flue Gas Characteristics				
5	Temperature	°C	116	USEPA 1,2,3&4
6	Velocity	m/s	23.62	USEPA 1,2,3&4
7	Volumetric Flow Rate	Nm ³ /s	659.78	USEPA 1,2,3&4
8	Particulate Matter	mg/Nm ³	27.19	USEPA 5
9	Sulfur dioxide	mg/Nm ³	926	USEPA 6
10	Oxides of Nitrogen	mg/Nm ³	403	USEPA 7
11	Arsenic as As	mg/Nm ³	0.042	USEPA method -29
12	Cadmium as Cd	mg/Nm ³	0.035	USEPA method -29
13	Cobalt as Co	mg/Nm ³	<0.001	USEPA method -29
14	Nickel as Ni	mg/Nm ³	0.038	USEPA method -29
15	Copper as Cu	mg/Nm ³	0.047	USEPA method -29
16	Mercury as Hg	mg/Nm ³	0.015	USEPA method -29
17	Chromium as Cr	mg/Nm ³	0.032	USEPA method -29
18	Manganese as Mn	mg/Nm ³	0.041	USEPA method -29
19	Antimony as Sb	mg/Nm ³	<0.001	USEPA method -29
20	Lead as Pb	mg/Nm ³	0.029	USEPA method -29
21	Thallium as TI	mg/Nm ³	<0.001	USEPA method -29
22	Vanadium as V	mg/Nm ³	<0.001	USEPA method -29

The results indicate that the PM is observed as 27.19 mg/Nm³.


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TABLE-20
STACK EMISSION MONITORING UNIT -III

Sr. No.	Parameters	UOM	Result	Methods
Date Of Sampling : 30/05/2024				
Sampling Time : 11.30 to 12.30 hrs				
Duration Of sampling : 60 mints				
Date of sample analysis : 01/06/2024				
Details of the source				
1	Capacity	MW	600	-
2	Stack Height	M	275	-
3	Duct Dimension	M	7.0	-
4	Duct area	m ²	38	-
Flue Gas Characteristics				
5	Temperature	°C	125	USEPA 1,2,3&4
6	Velocity	m/s	23.38	USEPA 1,2,3&4
7	Volumetric Flow Rate	Nm ³ /s	639.04	USEPA 1,2,3&4
8	Particulate Matter	mg/Nm ³	8.87	USEPA 5
9	Sulfur dioxide	mg/Nm ³	885	USEPA 6
10	Oxides of Nitrogen	mg/Nm ³	382	USEPA 7
11	Arsenic as As	mg/Nm ³	0.031	USEPA method -29
12	Cadmium as Cd	mg/Nm ³	0.022	USEPA method -29
13	Cobalt as Co	mg/Nm ³	<0.001	USEPA method -29
14	Nickel as Ni	mg/Nm ³	0.046	USEPA method -29
15	Copper as Cu	mg/Nm ³	0.036	USEPA method -29
16	Mercury as Hg	mg/Nm ³	0.011	USEPA method -29
17	Chromium as Cr	mg/Nm ³	0.024	USEPA method -29
18	Manganese as Mn	mg/Nm ³	0.041	USEPA method -29
19	Antimony as Sb	mg/Nm ³	<0.001	USEPA method -29
20	Lead as Pb	mg/Nm ³	0.030	USEPA method -29
21	Thallium as TI	mg/Nm ³	<0.001	USEPA method -29
22	Vanadium as V	mg/Nm ³	<0.001	USEPA method -29

The results indicate that the PM is observed as 8.87 mg/Nm³.


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TABLE-21
STACK EMISSION MONITORING UNIT -IV

Sr. No.	Parameters	UOM	Result	Methods
Date Of Sampling : 30/05/2024				
Sampling Time : 15.30 to 16.30 hrs				
Duration Of sampling : 60 mints				
Date of sample analysis : 01/06/2024				
Details of the source				
1	Capacity	MW	600	-
2	Stack Height	M	275	-
3	Duct Dimension	M	7.0	-
4	Duct area	m ²	38	-
Flue Gas Characteristics				
5	Temperature	°C	125	USEPA 1,2,3&4
6	Velocity	m/s	20.60	USEPA 1,2,3&4
7	Volumetric Flow Rate	Nm ³ /s	637.2	USEPA 1,2,3&4
8	Particulate Matter	mg/Nm ³	13.09	USEPA 5
9	Sulfur dioxide	mg/Nm ³	904	USEPA 6
10	Oxides of Nitrogen	mg/Nm ³	412	USEPA 7
11	Arsenic as As	mg/Nm ³	0.034	USEPA method -29
12	Cadmium as Cd	mg/Nm ³	0.026	USEPA method -29
13	Cobalt as Co	mg/Nm ³	<0.001	USEPA method -29
14	Nickel as Ni	mg/Nm ³	0.025	USEPA method -29
15	Copper as Cu	mg/Nm ³	0.038	USEPA method -29
16	Mercury as Hg	mg/Nm ³	0.010	USEPA method -29
17	Chromium as Cr	mg/Nm ³	0.030	USEPA method -29
18	Manganese as Mn	mg/Nm ³	0.029	USEPA method -29
19	Antimony as Sb	mg/Nm ³	<0.001	USEPA method -29
20	Lead as Pb	mg/Nm ³	0.024	USEPA method -29
21	Thallium as TI	mg/Nm ³	<0.001	USEPA method -29
22	Vanadium as V	mg/Nm ³	<0.001	USEPA method -29

The results indicate that the PM is observed as 13.09 mg/Nm³.

ENVIRONMENTAL MONITORING REPORT
FOR
6x600 MW COAL BASED POWER PLANT
OF KSK MAHANADI POWER COMPANY LTD
AT NARIYARA, JANJGIR-CHAMPA DISTRICT, CHHATTISGARH

MONTHLY REPORT: JUNE-2024

Client:

KSK Mahanadi Power Company Ltd
Nariyara, Chhattisgarh

Prepared by:



VIMTA Labs Ltd.
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Hyderabad – 500 051, Telangana State
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6.0 QUALITY ASSURANCE

Vimta Labs Ltd is accredited by NABL Govt. of India and follows quality systems as per ISO/IEC 17025-2017. The QA/QC procedures are laid prior to sample collection and laboratory analysis. It includes the standard procedures of sample collection, preservation, transportation and laboratory analysis with all documented procedures and continuous monitoring of Quality Control division.

7.0 RESULTS OF SURVEY DATA

The monitoring results of Ambient Air Quality analysis for the month of **June-2024** are presented in below **Table-6 to Table-10**.

7.1 Ambient Air Quality Monitoring Results

TABLE-6
AAQ MONITORING RESULTS

Monitoring Date	PM2.5	PM10	SO ₂	NO ₂	CO
	Particulate Matter(µg/m³)		µg/m³	µg/m³	mg/m³
BTG area – AAQ1					
04.06.2024	38.2	63.5	15.1	18.3	0.285
07.06.2024	35.5	65.2	13.9	16.4	0.251
11.06.2024	39.2	57.8	16.5	14.7	0.262
14.06.2024	40.8	66.3	15.2	17.9	0.275
18.06.2024	37.2	55.9	14.5	16.5	0.288
20.06.2024	40.3	64.4	15.7	18.2	0.239
24.06.2024	41.2	65.9	13.8	15.3	0.273
26.06.2024	40.1	62.1	14.4	16.3	0.227
Max	41.2	66.3	16.5	18.3	0.288
Min	35.5	55.9	13.8	14.7	0.227
Avg	39.1	62.6	14.9	16.7	0.263
98%ile	41.1	66.2	16.4	18.3	0.288
CHP area – AAQ2					
04.06.2024	44.6	73.2	14.5	18.6	0.272
07.06.2024	40.2	69.3	17.5	19.7	0.290
11.06.2024	38.2	75.3	15.2	16.6	0.315
14.06.2024	41.2	71.4	16.2	18.4	0.321
18.06.2024	43.9	68.5	15.7	16.8	0.300
20.06.2024	45.8	70.6	14.7	18.9	0.260
24.06.2024	42.7	76.2	16.9	18.4	0.288
26.06.2024	41.7	73.5	14.6	16.5	0.275
Max	45.8	76.2	17.5	19.7	0.321
Min	38.2	68.5	14.5	16.5	0.260
Avg	42.3	72.3	15.7	18.0	0.290
98%ile	45.6	76.1	17.4	19.6	0.320
Limits as per NAAQS	60	100	80	80	02
Test Methods	Gravimetric Method		Improved West & Geake Method	Modified Jacob & Hochheiser Method	NDIR spectroscopy method

Teflon filter paper was used in PM2.5 & whatman filter paper for PM10 weighed in Mettler electronic balance and computed as per standard methods PM2.5, PM10, SO₂, NO_x is monitored on 24 hrs. Basis CO is monitored on 8 hours basis All the values are expressed in µg/m³ except CO is measured in mg/m³


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	June 2024

TABLE-7
AAQ MONITORING RESULTS

Monitoring Date	PM2.5	PM10	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³
	Particulate Matter(µg/m ³)				
DM plant area – AAQ3					
04.06.2024	40.2	63.2	11.2	16.0	0.246
07.06.2024	35.8	68.2	12.3	14.8	0.234
11.06.2024	33.7	58.1	14.4	15.3	0.233
14.06.2024	42.4	60.2	11.5	16.5	0.224
18.06.2024	36.5	62.7	12.1	14.6	0.272
20.06.2024	40.7	54.9	13.5	16.4	0.229
24.06.2024	38.7	66.0	12.7	14.7	0.229
26.06.2024	39.7	57.1	14.3	16.0	0.255
Max	42.4	68.2	14.4	16.5	0.272
Min	33.7	54.9	11.2	14.6	0.224
Avg	38.5	61.3	12.8	15.6	0.240
98%ile	42.2	67.9	14.4	16.5	0.270
Ash handling area – AAQ4					
04.06.2024	39.7	71.0	14.6	17.0	0.287
07.06.2024	42.7	70.2	16.3	18.2	0.309
11.06.2024	40.4	78.3	14.2	17.5	0.291
14.06.2024	41.6	65.5	13.8	15.2	0.333
18.06.2024	45.2	78.9	15.3	16.8	0.295
20.06.2024	43.5	64.7	14.3	19.8	0.299
24.06.2024	42.9	75.2	13.9	17.4	0.319
26.06.2024	46.0	71.1	14.7	18.3	0.301
Max	46.0	78.9	16.3	19.8	0.333
Min	39.7	64.7	13.8	15.2	0.287
Avg	42.8	71.9	14.6	17.4	0.304
98%ile	45.9	78.8	16.2	19.6	0.331
Tarod Village – AAQ5					
04.06.2024	35.2	62.4	13.8	14.6	0.213
07.06.2024	28.5	58.3	12.9	15.8	0.191
11.06.2024	29.3	61.7	11.7	12.5	0.158
14.06.2024	33.2	59.8	13.3	15.1	0.183
18.06.2024	30.5	62.4	12.5	14.1	0.217
20.06.2024	29.7	61.1	11.5	15.0	0.198
24.06.2024	34.7	58.3	12.7	14.5	0.224
26.06.2024	31.5	63.3	12.9	13.6	0.202
Max	35.2	63.3	13.8	15.8	0.224
Min	28.5	58.3	11.5	12.5	0.158
Avg	31.6	60.9	12.7	14.4	0.198
98%ile	35.1	63.2	13.7	15.7	0.223
Jhalmala Village- AAQ6					
04.06.2024	34.7	60.5	12.5	14.2	0.192
07.06.2024	31.5	56.8	11.6	13.1	0.205
11.06.2024	32.8	57.8	10.8	12.8	0.194
14.06.2024	28.5	54.0	12.6	14.3	0.188
18.06.2024	33.7	59.8	11.6	14.6	0.157
20.06.2024	31.8	53.5	9.7	12.7	0.177
24.06.2024	29.2	61.9	11.4	13.6	0.215
26.06.2024	31.4	50.9	12.7	14.1	0.193
Max	34.7	61.9	12.7	14.6	0.215
Min	28.5	50.9	9.7	12.7	0.157
Avg	31.7	56.9	11.6	13.7	0.190
98%ile	34.6	61.7	12.7	14.6	0.214
Limits as per NAAQS	60	100	80	80	02


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TABLE-8
AAQ MONITORING RESULTS

Monitoring Date	PM2.5	PM10	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³
	Particulate				
Amora Village - AAQ7					
04.06.2024	28.4	57.6	12.1	14.7	0.143
07.06.2024	33.2	61.3	11.6	12.2	0.170
11.06.2024	30.8	50.8	12.8	13.6	0.152
14.06.2024	29.4	59.0	10.8	13.1	0.173
18.06.2024	28.7	52.6	11.7	14.1	0.156
20.06.2024	31.5	61.2	12.0	14.4	0.160
24.06.2024	27.4	53.5	11.8	13.1	0.157
26.06.2024	31.2	63.6	10.3	14.4	0.160
Max	33.2	63.6	12.8	14.7	0.173
Min	27.4	50.8	10.3	12.2	0.143
Avg	30.1	57.5	11.6	13.7	0.159
98%ile	33.0	63.3	12.7	14.7	0.173
Sonsari Village - AAQ8					
04.06.2024	33.3	54.6	13.5	14.6	0.148
07.06.2024	30.7	59.3	11.2	12.1	0.162
11.06.2024	31.5	53.7	10.8	13.4	0.142
14.06.2024	32.6	61.4	11.3	12.0	0.151
18.06.2024	30.4	52.5	12.5	15.4	0.139
20.06.2024	35.3	58.3	11.5	12.4	0.146
24.06.2024	26.7	47.3	10.6	13.1	0.125
26.06.2024	32.4	59.7	11.7	12.9	0.145
Max	35.3	61.4	13.5	15.4	0.162
Min	26.7	47.3	10.6	12.0	0.125
Avg	31.6	55.9	11.6	13.2	0.145
98%ile	35.0	61.2	13.4	15.3	0.160
Nariyara Village – AAQ9					
04.06.2024	30.2	58.3	10.8	13.5	0.174
07.06.2024	26.3	57.4	11.6	12.8	0.134
11.06.2024	27.3	55.4	10.7	13.8	0.147
14.06.2024	29.8	50.8	9.5	12.5	0.175
18.06.2024	32.6	58.2	12.5	14.4	0.158
20.06.2024	31.4	52.9	11.4	13.8	0.172
24.06.2024	30.7	55.3	10.5	12.5	0.184
26.06.2024	29.4	52.3	9.6	13.2	0.166
Max	32.6	58.3	12.5	14.4	0.184
Min	26.3	50.8	9.5	12.5	0.134
Avg	29.7	55.1	10.8	13.3	0.164
98%ile	32.4	58.3	12.4	14.3	0.183
Limits as per NAAQS	60	100	80	80	02

Teflon filter paper was used in PM2.5 & whatman filter paper for PM10 weighed in Mettler electronic balance and computed as per standard methods PM2.5, PM10, SO₂, NO_x is monitored on 24 hrs. Basis CO is monitored on 8 hours basis All the values are expressed in µg/m³ except CO is measured in mg/m³


	Monthly Environmental Monitoring Report for 6x600 MW Coal Based Power Plant of KSK Mahanadi Power Company Limited at Nariyara Village, Janjgir-Champa District, Chhattisgarh <div style="text-align: right;">June 2024</div>
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TABLE-9
AAQ MONITORING RESULTS

Monitoring Date & Location	Arsenic ng/m ³	Nickel ng/m ³	Lead µg/m ³	O ₃ µg/m ³	NH ₃ µg/m ³	C ₆ H ₆ µg/m ³	Benzo(a) Pyrene ng/m ³	Hg µg/m ³
BTG area – AAQ1								
04.06.2024	<1.0	1.3	<0.001	9.8	<20	<1.0	<0.1	<0.001
07.06.2024	<1.0	1.1	0.003	10.7	<20	<1.0	<0.1	<0.001
11.06.2024	<1.0	1.8	0.001	8.7	<20	<1.0	<0.1	<0.001
14.06.2024	<1.0	1.5	0.002	10.7	<20	<1.0	<0.1	<0.001
18.06.2024	<1.0	<1.0	0.001	11.3	<20	<1.0	<0.1	<0.001
20.06.2024	<1.0	1.5	<0.001	9.6	<20	<1.0	<0.1	<0.001
24.06.2024	<1.0	1.2	0.001	7.4	<20	<1.0	<0.1	<0.001
26.06.2024	<1.0	<1.0	<0.001	11.9	<20	<1.0	<0.1	<0.001
Max	<1.0	1.8	0.003	11.9	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	7.4	<20	<1.0	<0.1	<0.001
Avg	<1.0	1.4	0.002	10.0	<20	<1.0	<0.1	<0.001
98%	<1.0	1.8	0.003	11.8	<20	<1.0	<0.1	<0.001
CHP area – AAQ2								
04.06.2024	<1.0	2.2	<0.001	10.8	<20	<1.0	<0.1	<0.001
07.06.2024	<1.0	1.6	0.004	11.5	<20	<1.0	<0.1	<0.001
11.06.2024	<1.0	<1.0	0.001	15.3	<20	<1.0	<0.1	<0.001
14.06.2024	<1.0	3.0	<0.001	9.5	<20	<1.0	<0.1	<0.001
18.06.2024	<1.0	1.2	0.003	13.4	<20	<1.0	<0.1	<0.001
20.06.2024	<1.0	2.0	0.005	11.9	<20	<1.0	<0.1	<0.001
24.06.2024	<1.0	<1.0	0.002	10.7	<20	<1.0	<0.1	<0.001
26.06.2024	<1.0	1.7	0.004	13.0	<20	<1.0	<0.1	<0.001
Max	<1.0	3.0	0.005	15.3	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	9.5	<20	<1.0	<0.1	<0.001
Avg	<1.0	1.9	0.003	12.0	<20	<1.0	<0.1	<0.001
98%ile	<1.0	2.9	0.005	15.0	<20	<1.0	<0.1	<0.001
DM plant area – AAQ3								
04.06.2024	<1.0	1.4	<0.001	8.7	<20	<1.0	<0.1	<0.001
07.06.2024	<1.0	<1.0	0.003	11.2	<20	<1.0	<0.1	<0.001
11.06.2024	<1.0	1.1	<0.001	9.4	<20	<1.0	<0.1	<0.001
14.06.2024	<1.0	1.9	0.002	12.4	<20	<1.0	<0.1	<0.001
18.06.2024	<1.0	1.7	0.002	11.9	<20	<1.0	<0.1	<0.001
20.06.2024	<1.0	<1.0	<0.001	12.8	<20	<1.0	<0.1	<0.001
24.06.2024	<1.0	2.4	0.001	10.2	<20	<1.0	<0.1	<0.001
26.06.2024	<1.0	1.8	<0.001	11.5	<20	<1.0	<0.1	<0.001
Max	<1.0	2.4	0.003	12.8	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	8.7	<20	<1.0	<0.1	<0.001
Avg	<1.0	1.7	0.002	11.0	<20	<1.0	<0.1	<0.001
98%	<1.0	2.4	0.003	12.7	<20	<1.0	<0.1	<0.001

Below Detectable Limit for as and Ni 1.0 ng/m³ Below Detectable Limit for Pb 0.001 µg/m³ Ozone and CO is monitored on 8 hours basis Below Detectable Limit for O₃ 50 µg/m³ Below Detectable Limit for NH₃ 20 µg/m³


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TABLE-10
AAQ MONITORING RESULTS

Monitoring Date & Location	Arsenic ng/m ³	Nickel ng/m ³	Lead µg/m ³	O ₃ µg/m ³	NH ₃ µg/m ³	C ₆ H ₆ µg/m ³	Benzo(a) Pyrene ng/m ³	Hg µg/m ³
Ash handling area – AAQ4								
04.06.2024	<1.0	1.8	0.003	12.5	<20	<1.0	<0.1	<0.001
07.06.2024	<1.0	<1.0	<0.001	13.1	<20	<1.0	<0.1	<0.001
11.06.2024	<1.0	2.5	0.004	10.8	<20	<1.0	<0.1	<0.001
14.06.2024	<1.0	1.3	0.001	14.9	<20	<1.0	<0.1	<0.001
18.06.2024	<1.0	1.7	<0.001	12.6	<20	<1.0	<0.1	<0.001
20.06.2024	<1.0	2.0	0.004	13.2	<20	<1.0	<0.1	<0.001
24.06.2024	<1.0	<1.0	0.006	10.4	<20	<1.0	<0.1	<0.001
26.06.2024	<1.0	2.2	0.002	11.8	<20	<1.0	<0.1	<0.001
Max	<1.0	2.5	0.006	14.7	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	10.4	<20	<1.0	<0.1	<0.001
Avg	<1.0	1.9	0.003	12.4	<20	<1.0	<0.1	<0.001
98%	<1.0	2.5	0.006	14.7	<20	<1.0	<0.1	<0.001
Tarod Village – AAQ5								
04.06.2024	<1.0	<1.0	<0.001	5.1	<20	<1.0	<0.1	<0.001
07.06.2024	<1.0	<1.0	<0.001	6.6	<20	<1.0	<0.1	<0.001
11.06.2024	<1.0	<1.0	<0.001	7.6	<20	<1.0	<0.1	<0.001
14.06.2024	<1.0	<1.0	<0.001	6.2	<20	<1.0	<0.1	<0.001
18.06.2024	<1.0	<1.0	<0.001	5.9	<20	<1.0	<0.1	<0.001
20.06.2024	<1.0	<1.0	<0.001	6.7	<20	<1.0	<0.1	<0.001
24.06.2024	<1.0	<1.0	<0.001	5.6	<20	<1.0	<0.1	<0.001
26.06.2024	<1.0	<1.0	<0.001	7.3	<20	<1.0	<0.1	<0.001
Max	<1.0	<1.0	<0.001	7.6	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	5.1	<20	<1.0	<0.1	<0.001
Avg	<1.0	<1.0	<0.001	6.4	<20	<1.0	<0.1	<0.001
98%	<1.0	<1.0	<0.001	7.6	<20	<1.0	<0.1	<0.001
Jhalmala Village- AAQ-6								
04.06.2024	<1.0	<1.0	<0.001	5.3	<20	<1.0	<0.1	<0.001
07.06.2024	<1.0	<1.0	<0.001	7.5	<20	<1.0	<0.1	<0.001
11.06.2024	<1.0	<1.0	<0.001	6.7	<20	<1.0	<0.1	<0.001
14.06.2024	<1.0	<1.0	<0.001	7.7	<20	<1.0	<0.1	<0.001
18.06.2024	<1.0	<1.0	<0.001	7.0	<20	<1.0	<0.1	<0.001
20.06.2024	<1.0	<1.0	<0.001	6.3	<20	<1.0	<0.1	<0.001
24.06.2024	<1.0	<1.0	<0.001	7.6	<20	<1.0	<0.1	<0.001
26.06.2024	<1.0	<1.0	<0.001	7.3	<20	<1.0	<0.1	<0.001
Max	<1.0	<1.0	<0.001	7.7	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	5.3	<20	<1.0	<0.1	<0.001
Avg	<1.0	<1.0	<0.001	6.9	<20	<1.0	<0.1	<0.001
98%	<1.0	<1.0	<0.001	7.7	<20	<1.0	<0.1	<0.001
Limits as per	06	20	1.0	100	400	05	01	-

Below Detectable Limit for as and Ni 1.0 ng/m³, Below Detectable Limit for Pb 0.001 µg/m³ Ozone and CO is monitored on 8 hours basis Below Detectable Limit for O₃ 50 µg/m³ Below Detectable Limit for NH₃ 20 µg/m³


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TABLE-11
AAQ MONITORING RESULTS

Monitoring Date & Location	Arsenic ng/m ³	Nickel ng/m ³	Lead µg/m ³	O ₃ µg/m ³	NH ₃ µg/m ³	C ₆ H ₆ µg/m ³	Benzo(a) Pyrene ng/m ³	Hg µg/m ³
Amora Village – AAQ7								
04.06.2024	<1.0	<1.0	<0.001	6.7	<20	<1.0	<0.1	<0.001
07.06.2024	<1.0	<1.0	<0.001	7.5	<20	<1.0	<0.1	<0.001
11.06.2024	<1.0	<1.0	<0.001	5.4	<20	<1.0	<0.1	<0.001
14.06.2024	<1.0	<1.0	<0.001	6.4	<20	<1.0	<0.1	<0.001
18.06.2024	<1.0	<1.0	<0.001	8.1	<20	<1.0	<0.1	<0.001
20.06.2024	<1.0	<1.0	<0.001	7.5	<20	<1.0	<0.1	<0.001
24.06.2024	<1.0	<1.0	<0.001	5.7	<20	<1.0	<0.1	<0.001
26.06.2024	<1.0	<1.0	<0.001	6.8	<20	<1.0	<0.1	<0.001
Max	<1.0	<1.0	<0.001	8.1	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	5.4	<20	<1.0	<0.1	<0.001
Avg	<1.0	<1.0	<0.001	6.8	<20	<1.0	<0.1	<0.001
98%ile	<1.0	<1.0	<0.001	8.0	<20	<1.0	<0.1	<0.001
Sonsari Village – AAQ8								
04.06.2024	<1.0	<1.0	<0.001	7.6	<20	<1.0	<0.1	<0.001
07.06.2024	<1.0	<1.0	<0.001	5.7	<20	<1.0	<0.1	<0.001
11.06.2024	<1.0	<1.0	<0.001	7.5	<20	<1.0	<0.1	<0.001
14.06.2024	<1.0	<1.0	<0.001	6.7	<20	<1.0	<0.1	<0.001
18.06.2024	<1.0	<1.0	<0.001	5.8	<20	<1.0	<0.1	<0.001
20.06.2024	<1.0	<1.0	<0.001	6.6	<20	<1.0	<0.1	<0.001
24.06.2024	<1.0	<1.0	<0.001	7.8	<20	<1.0	<0.1	<0.001
26.06.2024	<1.0	<1.0	<0.001	4.8	<20	<1.0	<0.1	<0.001
Max	<1.0	<1.0	<0.001	7.8	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	4.8	<20	<1.0	<0.1	<0.001
Avg	<1.0	<1.0	<0.001	6.7	<20	<1.0	<0.1	<0.001
98%	<1.0	<1.0	<0.001	7.8	<20	<1.0	<0.1	<0.001
Nariyara Village – AAQ9								
04.06.2024	<1.0	<1.0	<0.001	5.9	<20	<1.0	<0.1	<0.001
07.06.2024	<1.0	<1.0	<0.001	6.5	<20	<1.0	<0.1	<0.001
11.06.2024	<1.0	<1.0	<0.001	7.8	<20	<1.0	<0.1	<0.001
14.06.2024	<1.0	<1.0	<0.001	8.5	<20	<1.0	<0.1	<0.001
18.06.2024	<1.0	<1.0	<0.001	7.6	<20	<1.0	<0.1	<0.001
20.06.2024	<1.0	<1.0	<0.001	8.3	<20	<1.0	<0.1	<0.001
24.06.2024	<1.0	<1.0	<0.001	7.8	<20	<1.0	<0.1	<0.001
26.06.2024	<1.0	<1.0	<0.001	8.2	<20	<1.0	<0.1	<0.001
Max	<1.0	<1.0	<0.001	8.5	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	5.9	<20	<1.0	<0.1	<0.001
Avg	<1.0	<1.0	<0.001	7.6	<20	<1.0	<0.1	<0.001
98%	<1.0	<1.0	<0.001	8.5	<20	<1.0	<0.1	<0.001
Limits as per NAAQS	06	20	1.0	100	400	05	01	-

Below Detectable Limit for as and Ni 1.0 ng/m³, Below Detectable Limit for Pb 0.001 µg/m³ Ozone and CO is monitored on 8 hours basis Below Detectable Limit for O₃ 50 µg/m³ Below Detectable Limit for NH₃ 20 µg/m³

7.1.1 Observations (Inside the premises)

PM2.5: The maximum value for PM2.5 observed at AHP area as 46.0 $\mu\text{g}/\text{m}^3$ and minimum value for PM2.5 at DM plant area as 33.7 $\mu\text{g}/\text{m}^3$. The 24 hours applicable limit inside the plant premises 60 $\mu\text{g}/\text{m}^3$ for industrial area.

PM10: The maximum value for PM10 observed at AHP area as 78.9 $\mu\text{g}/\text{m}^3$ and minimum value for PM10 at DM Plant area as 54.9 $\mu\text{g}/\text{m}^3$. The 24 hours applicable limit inside the plant premises 100 $\mu\text{g}/\text{m}^3$ for industrial area.

SO₂: The maximum value for SO₂ observed at CHP plant area as 17.5 $\mu\text{g}/\text{m}^3$ and minimum value for SO₂ at DM Plant area as 11.2 $\mu\text{g}/\text{m}^3$. The 24 hours applicable limit inside the plant premises 80 $\mu\text{g}/\text{m}^3$ for industrial area.

NO₂: The maximum value for NO₂ observed at AHP area as 19.8 $\mu\text{g}/\text{m}^3$ and minimum value for NO₂ at DM Plant area as 14.6 $\mu\text{g}/\text{m}^3$. The 24 hours applicable limit inside the plant premises 80 $\mu\text{g}/\text{m}^3$ for industrial area.

CO: The maximum value for CO observed at AHP area as 0.333 mg/m^3 and minimum value for CO at DM plant as 0.224 mg/m^3 . The 8 hours applicable limit inside the plant premises 02 mg/m^3 for industrial area.

Ammonia: The maximum and minimum value for Ammonia observed at all the locations as <20 $\mu\text{g}/\text{m}^3$. The 24 hours' applicable limit inside the plant premises 400 $\mu\text{g}/\text{m}^3$ for industrial area

Nickel: The maximum value for Nickel observed at CHP area as 3.0 ng/m^3 and <1.0 ng/m^3 minimum value for BTG, DM, CHP & AHP Plant area. The 24 hours' applicable limit inside the plant premises 20 ng/m^3 for industrial area.


Arsenic: The maximum and minimum value for Arsenic observed at all the locations as <1.0 ng/m^3 . The 24 hours applicable limit inside the plant premises 6 ng/m^3 for industrial area

Lead: The maximum value for Lead observed at AHP area as 0.006 $\mu\text{g}/\text{m}^3$ and minimum value for BTG, DM, CHP & AHP Plant area as <0.001 $\mu\text{g}/\text{m}^3$. The 24 hours' applicable limit inside the plant premises 1 $\mu\text{g}/\text{m}^3$ for industrial area.

Ozone: The maximum value for Ozone observed at AHP area as 15.3 $\mu\text{g}/\text{m}^3$ and minimum value for Ozone DM Plant area as 8.4 $\mu\text{g}/\text{m}^3$. The 8 hours' applicable limit inside the plant premises 100 $\mu\text{g}/\text{m}^3$ for industrial area.

Benzo(a)Pyrene: The maximum and minimum value for Benzo(a)Pyrene observed at all the locations as <0.1 ng/m^3 . The 24 hours applicable limit inside the plant premises 1 ng/m^3 for industrial area

Benzene: The maximum and minimum value for Benzene observed at all the locations as <1.0 $\mu\text{g}/\text{m}^3$. The 24 hours applicable limit inside the plant premises 5 $\mu\text{g}/\text{m}^3$ for industrial area

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Mercury: The maximum and minimum value for Mercury observed at all the locations as $<0.001 \mu\text{g} / \text{m}^3$ for 24 hours.

7.1.2 Observations (Outside the premises)

PM_{2.5}: The maximum value for PM_{2.5} observed at Tarod village as $35.2 \mu\text{g} / \text{m}^3$ and minimum value for PM_{2.5} at Nariyara village as $26.3 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $60 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

PM₁₀: The maximum value for PM₁₀ observed at Amora village as $63.6 \mu\text{g} / \text{m}^3$ and minimum value for PM₁₀ at Sonsari village as $47.3 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $100 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

SO₂: The maximum value for SO₂ observed at Tarod village as $13.8 \mu\text{g} / \text{m}^3$ and minimum value for SO₂ at Nariyara village as $9.5 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the Plant premises $80 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

NO_x: The maximum value for NO_x observed at Tarod village as $15.8 \mu\text{g} / \text{m}^3$ and minimum value for NO_x at Sonsari village as $12.0 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $80 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

CO: The maximum value for CO observed at Tarod village as $0.224 \text{ mg} / \text{m}^3$ and minimum value for CO at Sonsari village as $0.125 \text{ mg} / \text{m}^3$. The 8 hours' applicable limit outside the plant premises $02 \text{ mg} / \text{m}^3$ for Rural/Residential area.

Ammonia: The maximum and minimum value for Ammonia observed at all the locations as $<20 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $400 \mu\text{g} / \text{m}^3$ for Rural/Residential area.


Nickel: The maximum and minimum value for Nickel observed at all the locations as $<1.0 \text{ ng} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $20 \text{ ng} / \text{m}^3$ for Rural/Residential area.

Arsenic: The maximum and minimum value for Arsenic observed at all the locations as $<1.0 \text{ ng} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $6 \text{ ng} / \text{m}^3$ for Rural/Residential area

Lead: The maximum and minimum value for Lead observed at all the locations as $<0.001 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $1 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

Ozone: The maximum value for Ozone observed at Nariyara village as $8.5 \mu\text{g} / \text{m}^3$ and minimum value for Ozone at Amora village as $4.6 \mu\text{g} / \text{m}^3$. The 8 hours applicable limit outside the plant premises $100 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

Benzo(a)Pyrene: The maximum and minimum value for Benzo(a)Pyrene observed at all the locations as $<0.1 \text{ ng} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $1 \text{ ng} / \text{m}^3$ for Rural/Residential area

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Benzene: The maximum and minimum value for Benzene observed at all the locations as $<1.0 \mu\text{g}/\text{m}^3$. The 24 hours applicable limit outside the plant premises $5 \mu\text{g}/\text{m}^3$ for Rural/Residential area

Mercury: The maximum and minimum value for Mercury observed at all the locations as $<0.001 \mu\text{g}/\text{m}^3$ for 24 hours.

7.1.2 Results and conclusions:

The results of the monitored data indicate that the ambient air quality of the region in general is conformity with respect to norms of National Ambient Air Quality standards of CPCB, at all locations monitored.

7.2 **Noise Monitoring**

7.2.1 Source Noise Monitoring – Inside the Plant Premises

The spot noise levels observed inside the premises at various locations is given in **Table-12**

TABLE-12
INDUSTRIAL NOISE LEVELS IN WORK ENVIRONMENT

Sr. No	Code	Location	Date of sampling	Noise Level L_{eq} [dB(A)]
1	N1	TG floor	03/06/2024	70.8
2	N2	Cooling tower#3	03/06/2024	69.2
3	N3	Main Gate	03/06/2024	70.2
4	N4	Boiler feed pump	03/06/2024	83.2
5	N5	Admin Building area	06/06/2024	53.8
6	N6	CHP Machine area	06/06/2024	83.1
7	N7	AHP area	06/06/2024	69.7
8	N8	Ash Silo area	10/06/2024	70.5
9	N9	CW Pump house	10/06/2024	82.4
10	N10	Compressor 1	10/06/2024	83.1
11	N11	Compressor 2	06/06/2024	84.1
12	N12	Compressor 3	03/06/2024	82.4
13	N13	Compressor 4	10/06/2024	83.3

7.2.1.1 Observations

The industrial noise levels within the premises at Work Zone area are observed to be in the range of 53.8 to 84.1 dB (A), which are within the prescribed limit of 85 dB (A).

7.2.3 Noise Monitoring – Outside the Premises

The statistical analysis is done for measured noise levels at four locations in the study area. The parameters are analyzed for L_{day} , L_{night} , and L_{dn} . The statistical analysis results are given in **Table-13**.

TABLE-13
AMBIENT NOISE LEVELS IN THE STUDY AREA

All the values are given in dB (A)

Code	Location	Date of sampling	L_{10}	L_{50}	L_{90}	L_{eq}	L_{day}	L_{night}	L_{dn}
N14	Banahill Village	04.06.2024	54.1	50.2	46.5	51.2	52.0	42.4	49.1
N15	Tarod Village	07.06.2024	52.8	48.9	45.2	49.9	50.7	43.1	48.1
N16	Rogda Village	11.06.2024	53.2	49.3	45.6	50.3	51.1	41.5	47.8
N17	Jhalmala Village	14.06.2024	54.3	50.4	46.7	51.4	52.2	42.6	49.4
N18	Nariyara Village	18.06.2024	52.9	49.0	45.3	50.0	50.8	43.0	47.4
N19	Sonsari Village	24.06.2024	53.7	49.8	46.1	50.8	51.6	41.5	48.4
N20	Amora Village	26.06.2024	55.4	51.5	47.8	52.5	53.3	40.9	50.2
N21	Arasmeta Village	27.06.2024	53.4	49.5	45.8	50.5	51.3	42.4	48.2

7.2.3.1 Observations

a) Day time Noise Levels (L_{day})

Residential Area

The daytime (L_{day}) noise levels are observed to be in the range of 53.3 dB (A) – 50.7 dB (A), which are within the prescribed limit of 55 dB (A).

b) Night time Noise Levels (L_{night})

Residential Area

The nighttime (L_{night}) noise levels were observed to be in the range of 43.1 dB (A) – 40.9 dB (A), which are within the prescribed limit of 45 dB (A).

7.3 Ground Water Quality

Four ground water samples were collected around Ash pond area and four ground water samples were collected at villages around the plant site and analyzed for various parameters. The analytical results are presented below in **Table-14** and **Table-15**.


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TABLE-14
GROUND WATER QUALITY AROUND ASHPOND

Sr. No	Parameter	Units	GW1	GW2	GW3	GW4	Limits as per IS:10500
	Sampling season		Monsoon Season				
	Sampling date		19.06.2024	19.06.2024	19.06.2024	19.06.2024	
	Date of analysis		21.06.2024	21.06.2024	21.06.2024	21.06.2024	
1	pH	--	7.43	7.60	7.32	7.48	6.5 – 8.5 (NR)
2	Color	Hazen	5	10	9	11	5(15)
3	Taste	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Odour	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Conductivity	µs/cm	1033	1103	965	883	\$
6	Turbidity	NTU	5	4	4	5	1(5)
7	Total Dissolved Solids	mg/l	681	716	636	591	500(2000)
8	Total Hardness as CaCO ₃	mg/l	311	338	291	258	200(600)
9	Total Alkalinity as CaCO ₃	mg/l	199	217	194	180	200(600)
10	Calcium as Ca ²⁺	mg/l	66.2	69.3	62.8	58.1	75(200)
11	Magnesium as Mg ²⁺	mg/l	35.4	40.1	32.6	27.4	30(100)
12	Residual Chlorine	mg/l	<0.2	<0.2	<0.2	<0.2	0.2(1)
13	Boron as B	mg/l	0.4	0.7	0.8	0.5	0.5(1)
14	Chloride as Cl ⁻	mg/l	166.4	171.3	151.3	140.6	250(1000)
15	Sulphate as SO ₄ ²⁺	mg/l	66.4	73.2	60.5	51.2	200(400)
16	Fluorides as F	mg/l	1.1	1.2	0.8	0.6	1.0(1.5)
17	Nitrate as NO ₃	mg/l	12.6	15.5	11.5	8.2	45(NR)
18	Sodium as Na ⁺	mg/l	84.2	87.1	80.6	78.4	\$
19	Potassium as K ⁺	mg/l	17.4	14.3	12.6	10.2	\$
20	Phenolic Compounds	mg/l	<0.001	<0.001	<0.001	<0.001	0.001(0.002)
21	Cyanides as CN	mg/l	<0.02	<0.02	<0.02	<0.02	0.05 (NR)
22	Anionic Detergents	mg/l	<0.1	<0.1	<0.1	<0.1	0.2 (1.0)
23	Mineral Oil	mg/l	<0.01	<0.01	<0.01	<0.01	0.5 (NR)
24	Cadmium as Cd	mg/l	<0.001	<0.001	<0.001	<0.001	0.003 (NR)
25	Total Arsenic as As	mg/l	<0.01	<0.01	<0.01	<0.01	0.01 (0.05)
26	Copper as Cu	mg/l	<0.01	<0.01	<0.01	<0.01	0.05 (1.5)
27	Led as Pb	mg/l	<0.01	<0.01	<0.01	<0.01	0.01 (NR)
28	Manganse as Mn	mg/l	<0.01	<0.01	<0.01	<0.01	0.1 (0.3)
29	Iron as Fe	mg/l	0.08	0.14	0.08	0.17	0.3(NR)
30	Total Chromium (as Cr)	mg/l	<0.05	<0.05	<0.05	<0.05	0.05(NR)
31	Selenium as Se	mg/l	<0.01	<0.01	<0.01	<0.01	0.01(NR)
32	Zinc as Zn	mg/l	0.35	0.27	0.37	0.42	5(15)
33	Aluminium as Al	mg/l	<0.01	<0.01	<0.01	<0.01	0.03(0.2)
34	Mercury as Hg	mg/l	<0.001	<0.001	<0.001	<0.001	0.001(NR)
35	Pesticides	mg/l	Absent	Absent	Absent	Absent	Absent
36	E. Coli	--	Absent	Absent	Absent	Absent	Absent
37	Total Coliforms	MPN/100ml	Absent	Absent	Absent	Absent	10

Note: \$ - Limits not specified; NR - No Relaxation

Limits are shown in IS 10500 are Acceptable limits (Requirement) and in parenthesis are Permissible limit in absence of alternate source

Sampling Locations

GW1. Ash pond Location-1, GW2. Ash pond Location-2, GW3. Ash pond Location-3, GW4. Ash pond Location-4

7.3.1 Observations

7.3.2.1 Ground Water Quality

The analysis results indicate that the pH and conductivity of the ground water was found to be in the range of 7.32– 7.48 and 883 to 1103 µS/cm. The Total Dissolved Solids were found to be well within the limits ranging from 591 to 716 mg/L. Other parameters like Chlorides, Sulphates, Nitrates and Fluorides were observed to be well within the prescribed limits. The overall physico-chemical analysis of all the parameters is well within the standards as per IS: 10500.

TABLE-15
GROUND WATER QUALITY IN STUDY AREA

Sr. No	Parameter	Units	GW1	GW2	GW3	GW4	Limits as per IS:10500
	Sampling season		Monsoon Season				
	Sampling date		18.06.2024	18.06.2024	18.06.2024	18.06.2024	
	Date of analysis		21.06.2024	21.06.2024	21.06.2024	21.06.2024	
1	pH	--	7.23	7.32	7.41	7.35	6.5 – 8.5 (NR)
2	Color	Hazen	1	1	1	1	5(15)
3	Taste	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Odour	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Conductivity	µs/cm	732	904	532	1395	\$
6	Turbidity	NTU	1	1	1	1	1(5)
7	Total Dissolved Solids	mg/l	483	578	345	920	500(2000)
8	Total Hardness as CaCO ₃	mg/l	214	267	168	441	200(600)
9	Total Alkalinity as CaCO ₃	mg/l	158.6	182.5	99.2	302.5	200(600)
10	Calcium as Ca ²⁺	mg/l	48.6	60.3	34.7	96.7	75(200)
11	Magnesium as Mg ²⁺	mg/l	22.4	28.2	19.8	48.5	30(100)
12	Residual Chlorine	mg/l	<0.2	<0.2	<0.2	<0.2	0.2(1)
13	Boron as B	mg/l	0.04	0.03	0.02	0.07	0.5(1)
14	Chloride as Cl ⁻	mg/l	96.4	143.7	87.3	202.6	250(1000)
15	Sulphate as SO ₄ ²⁺	mg/l	61.5	55.2	35.6	87.4	200(400)
16	Fluorides as F	mg/l	0.6	0.7	0.5	0.9	1.0(1.5)
17	Nitrate as NO ₃	mg/l	7.5	9.5	6.7	18.6	45(NR)
18	Sodium as Na ⁺	mg/l	64.7	79.2	41.6	104.6	\$
19	Potassium as K ⁺	mg/l	9.4	10.4	6.3	22.6	\$
20	Phenolic Compounds	mg/l	<0.001	<0.001	<0.001	<0.001	0.001(0.002)
21	Cyanides as CN	mg/l	<0.02	<0.02	<0.02	<0.02	0.05 (NR)
22	Anionic Detergents	mg/l	<0.1	<0.1	<0.1	<0.1	0.2 (1.0)
23	Mineral Oil	mg/l	<0.01	<0.01	<0.01	<0.01	0.5 (NR)
24	Cadmium as Cd	mg/l	<0.001	<0.001	<0.001	<0.001	0.003 (NR)
25	Total Arsenic as As	mg/l	<0.01	<0.01	<0.01	<0.01	0.01 (0.05)
26	Copper as Cu	mg/l	<0.01	<0.01	<0.01	<0.01	0.05 (1.5)
27	Lead as Pb	mg/l	<0.01	<0.01	<0.01	<0.01	0.01 (NR)
28	Manganese as Mn	mg/l	<0.01	<0.01	<0.01	<0.01	0.1 (0.3)
29	Iron as Fe	mg/l	0.04	0.07	0.05	0.13	0.3(NR)
30	Total Chromium (as Cr)	mg/l	<0.05	<0.05	<0.05	<0.05	0.05(NR)
31	Selenium as Se	mg/l	<0.01	<0.01	<0.01	<0.01	0.01(NR)
32	Zinc as Zn	mg/l	0.17	0.21	0.18	0.30	5(15)
33	Aluminium as Al	mg/l	<0.01	<0.01	<0.01	<0.01	0.03(0.2)
34	Mercury as Hg	mg/l	<0.001	<0.001	<0.001	<0.001	0.001(NR)
35	Pesticides	mg/l	Absent	Absent	Absent	Absent	Absent
36	E. Coli	--	Absent	Absent	Absent	Absent	Absent
37	Total Coliforms	MPN/100ml	Absent	Absent	Absent	Absent	10

Note: \$ - Limits not specified; NR - No Relaxation Limits are shown in IS 10500 are Acceptable limits (Requirement) and in parenthesis are Permissible limit in absence of alternate source

Sampling Locations

GW1. Amora Village (Bore well) , GW2. Rogda (Bore well)

GW3. Banahill (Bore well) , GW4. Nariyara Village (Bore well)

7.3.1 Observations

7.3.2.1 Ground Water Quality

The analysis results indicate that the pH and conductivity of the ground water was found to be in the range of 7.23 - 7.41 and 532 to 1395 µS/cm. The Total Dissolved Solids were found to be well within the limits ranging from 345 to 920 mg/L. Other parameters like Chlorides, Sulphates, Nitrates and Fluorides were observed to be well within the prescribed limits. The overall physico-chemical analysis of all the parameters is well within the standards as per IS: 10500.

7.4 Waste Water Quality

Four waste water samples were collected within the plant site and analyzed for various parameters. The analytical results are presented below in **Table-16**.

TABLE-16
WASTE WATER QUALITY


Sr. No.	Parameters	Units	CT Blow Down	Boiler Blow Down	Condenser Cooling water	Guard Pond	Limits as per CECB& CPCB
			WW1	WW2	WW3	WW4	
	Sampling Date		19.06.2024	19.06.2024	19.06.2024	19.06.2024	
	Date of Analysis		21.06.2024	21.06.2024	21.06.2024	21.06.2024	
1	p ^H	-	7.82	7.90	7.68	7.87	6.5-8.5
	Temperature	°C	29.0	28.6	29.3	27.5	
3	Total Dissolved Solids	mg/l	589	9	6	578	-
4	Total Suspended Solids	mg/l	13.2	<1.0	<1.0	62.2	100
5	Dissolved Oxygen	mg/l	5.1	5.0	5.2	5.4	-
6	Biochemical Oxygen Demand, (3 days at 27°C)	mg/l	<3	<3	<3	<3	-
7	Chemical Oxygen Demand	mg/l	<5	<5	<5	47	-
8	Chlorides	mg/l	67.2	14.4	21.4	137.5	-
9	Sulphates	mg/l	52.3	20.8	41.2	114.2	-
10	Phosphates	mg/l	0.38	<0.01	<0.01	1.03	5.0
11	Zinc	mg/l	0.12	<0.01	<0.01	0.39	1.0
12	Chromium	mg/l	<0.01	<0.01	<0.01	<0.01	0.2
13	Copper	mg/l	<0.01	<0.01	<0.01	<0.01	1.0
14	Free Available chlorine	mg/l	<0.2	<0.2	<0.2	<0.2	0.5
15	Irons	mg/l	<0.01	<0.01	<0.01	0.18	1.0
16	Oil & Grease	mg/l	<1.0	<1.0	<1.0	<1.0	20

7.4.1 Results and Conclusions

The data analysis to be as per CFO Norms and analytical results indicated that the guard pond waste water is well within the standard limits specified by EPA Notification [G.S.R.7, dt. Dec.22,1998].

7.4.2 Observations-Waste water quality.

The analysis results indicate that the pH ranges from 7.68 – 7.90 and the Total Suspended Solids were found to be within the limits ranging from <1.0-62.2 mg/l. Other parameters like Zinc, Chromium, Available, chloride, Iron and Oil& Grease were observed to be well within the prescribed limits.

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7.4.3 Sewage Waste Water Quality

One Sewage water samples is collected and analyzed for various parameters. The survey analytical results are given in **Table-17**.

TABLE-17
SEWAGE WASTE WATER QUALITY

Sr.No	Parameter	UOM	WW5 (STP Outlet)
	Sampling Date		19.06.2024
	Date of Analysis		21.06.2024
1	pH	-	7.51
2	Total Dissolved Solids	mg/l	536
3	Total Suspended Solids	mg/l	28.2
4	Dissolved Oxygen	mg/l	5.2
5	Bio Chemical Oxygen Demand for 3 day 27°C	mg/l	<1.0
6	Chemical Oxygen Demand	mg/l	34
7	Chlorides	mg/l	97
8	Sulphates	mg/l	121.3
9	Phosphates	mg/l	0.29
10	Zinc	mg/l	0.42
11	Chromium	mg/l	<0.01
12	Copper	mg/l	<0.01
13	Available Chlorine	mg/l	<0.2
14	Iron	mg/l	0.17
15	Oil and Grease	mg/l	<1.0

7.5 Water Depth measurement

Four ground water depths at villages and plant and four ash pond area locations were measured and results are given in **Table-18**.

TABLE-18
WATER DEPTH MEASUREMENT

Location Code	Location Name	Depth(m)
BW1	Banahil Village	3.45
OW1	Nariyara Village	3.16
OW2	Amora Village	3.27
OW3	Rogda Village	4.48
ASH1	Ash pond Location-1	6.23
ASH2	Ash pond Location-2	8.54
ASH3	Ash pond Location-3	7.52
ASH4	Ash pond Location-4	5.76

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7.6 Stack Emission Monitoring

The power plant has stack of height 275.0-m, which is the major source of air pollution. The stack emission monitoring for Unit-II, Unit-III and Unit - IV has been carried out and results are given in **Table-19 to Table-21**.

TABLE-19
STACK EMISSION MONITORING UNIT -II

Sr. No.	Parameters	UOM	Result	Methods
Date Of Sampling : 22/06/2024				
Sampling Time : 11.00 to 12.00 hrs				
Duration Of sampling : 60 mints				
Date of sample analysis : 24/06/2024				
Details of the source				
1	Capacity	MW	600	-
2	Stack Height	M	275	-
3	Duct Dimension	M	7.0	-
4	Duct area	m ²	38	-
Flue Gas Characteristics				
5	Temperature	°C	122	USEPA 1,2,3&4
6	Velocity	m/s	24.56	USEPA 1,2,3&4
7	Volumetric Flow Rate	Nm ³ /s	648.23	USEPA 1,2,3&4
8	Particulate Matter	mg/Nm ³	25.46	USEPA 5
9	Sulfur dioxide	mg/Nm ³	877	USEPA 6
10	Oxides of Nitrogen	mg/Nm ³	385	USEPA 7
11	Arsenic as As	mg/Nm ³	0.034	USEPA method -29
12	Cadmium as Cd	mg/Nm ³	0.021	USEPA method -29
13	Cobalt as Co	mg/Nm ³	<0.001	USEPA method -29
14	Nickel as Ni	mg/Nm ³	0.025	USEPA method -29
15	Copper as Cu	mg/Nm ³	0.035	USEPA method -29
16	Mercury as Hg	mg/Nm ³	0.012	USEPA method -29
17	Chromium as Cr	mg/Nm ³	0.023	USEPA method -29
18	Manganese as Mn	mg/Nm ³	0.033	USEPA method -29
19	Antimony as Sb	mg/Nm ³	<0.001	USEPA method -29
20	Lead as Pb	mg/Nm ³	0.031	USEPA method -29
21	Thallium as TI	mg/Nm ³	<0.001	USEPA method -29
22	Vanadium as V	mg/Nm ³	<0.001	USEPA method -29

The results indicate that the PM is observed as 25.46 mg/Nm³.


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TABLE-20
STACK EMISSION MONITORING UNIT -III

Sr. No.	Parameters	UOM	Result	Methods
Date Of Sampling : 22/06/2024				
Sampling Time : 14.30 to 15.30 hrs				
Duration Of sampling : 60 mints				
Date of sample analysis : 24/06/2024				
Details of the source				
1	Capacity	MW	600	-
2	Stack Height	M	275	-
3	Duct Dimension	M	7.0	-
4	Duct area	m ²	38	-
Flue Gas Characteristics				
5	Temperature	°C	119	USEPA 1,2,3&4
6	Velocity	m/s	25.21	USEPA 1,2,3&4
7	Volumetric Flow Rate	Nm ³ /s	652.33	USEPA 1,2,3&4
8	Particulate Matter	mg/Nm ³	8.44	USEPA 5
9	Sulfur dioxide	mg/Nm ³	987	USEPA 6
10	Oxides of Nitrogen	mg/Nm ³	407	USEPA 7
11	Arsenic as As	mg/Nm ³	0.023	USEPA method -29
12	Cadmium as Cd	mg/Nm ³	0.018	USEPA method -29
13	Cobalt as Co	mg/Nm ³	<0.001	USEPA method -29
14	Nickel as Ni	mg/Nm ³	0.030	USEPA method -29
15	Copper as Cu	mg/Nm ³	0.051	USEPA method -29
16	Mercury as Hg	mg/Nm ³	0.008	USEPA method -29
17	Chromium as Cr	mg/Nm ³	0.018	USEPA method -29
18	Manganese as Mn	mg/Nm ³	0.037	USEPA method -29
19	Antimony as Sb	mg/Nm ³	<0.001	USEPA method -29
20	Lead as Pb	mg/Nm ³	0.021	USEPA method -29
21	Thallium as TI	mg/Nm ³	<0.001	USEPA method -29
22	Vanadium as V	mg/Nm ³	<0.001	USEPA method -29

The results indicate that the PM is observed as 8.44 mg/Nm³.


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TABLE-21
STACK EMISSION MONITORING UNIT -IV

Sr. No.	Parameters	UOM	Result	Methods
Date Of Sampling : 21/06/2024				
Sampling Time : 11.30 to 12.30 hrs				
Duration Of sampling : 60 mints				
Date of sample analysis : 24/06/2024				
Details of the source				
1	Capacity	MW	600	-
2	Stack Height	M	275	-
3	Duct Dimension	M	7.0	-
4	Duct area	m ²	38	-
Flue Gas Characteristics				
5	Temperature	°C	120	USEPA 1,2,3&4
6	Velocity	m/s	23.77	USEPA 1,2,3&4
7	Volumetric Flow Rate	Nm ³ /s	643.87	USEPA 1,2,3&4
8	Particulate Matter	mg/Nm ³	11.90	USEPA 5
9	Sulfur dioxide	mg/Nm ³	946	USEPA 6
10	Oxides of Nitrogen	mg/Nm ³	396	USEPA 7
11	Arsenic as As	mg/Nm ³	0.027	USEPA method -29
12	Cadmium as Cd	mg/Nm ³	0.017	USEPA method -29
13	Cobalt as Co	mg/Nm ³	<0.001	USEPA method -29
14	Nickel as Ni	mg/Nm ³	0.032	USEPA method -29
15	Copper as Cu	mg/Nm ³	0.043	USEPA method -29
16	Mercury as Hg	mg/Nm ³	0.011	USEPA method -29
17	Chromium as Cr	mg/Nm ³	0.018	USEPA method -29
18	Manganese as Mn	mg/Nm ³	0.041	USEPA method -29
19	Antimony as Sb	mg/Nm ³	<0.001	USEPA method -29
20	Lead as Pb	mg/Nm ³	0.032	USEPA method -29
21	Thallium as TI	mg/Nm ³	<0.001	USEPA method -29
22	Vanadium as V	mg/Nm ³	<0.001	USEPA method -29

The results indicate that the PM is observed as 11.90 mg/Nm³.

ENVIRONMENTAL MONITORING REPORT
FOR
6x600 MW COAL BASED POWER PLANT
OF KSK MAHANADI POWER COMPANY LTD
AT NARIYARA, JANJGIR-CHAMPA DISTRICT, CHHATTISGARH

MONTHLY REPORT: JULY-2024

Client:

KSK Mahanadi Power Company Ltd
Nariyara, Chhattisgarh

Prepared by:



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6.0 QUALITY ASSURANCE

Vimta Labs Ltd is accredited by NABL Govt. of India and follows quality systems as per ISO/IEC 17025-2017. The QA/QC procedures are laid prior to sample collection and laboratory analysis. It includes the standard procedures of sample collection, preservation, transportation and laboratory analysis with all documented procedures and continuous monitoring of Quality Control division.

7.0 RESULTS OF SURVEY DATA

The monitoring results of Ambient Air Quality analysis for the month of **July-2024** are presented in below **Table-6 to Table-10**.

7.1 Ambient Air Quality Monitoring Results

TABLE-6
AAQ MONITORING RESULTS

Monitoring Date	PM2.5	PM10	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³
	Particulate Matter(µg/m ³)				
BTG area – AAQ1					
03.07.2024	41.7	55.3	13.3	16.4	0.267
05.07.2024	37.6	62.0	15.4	17.8	0.237
09.07.2024	41.5	61.0	14.7	15.4	0.244
12.07.2024	38.4	63.1	16.7	17.5	0.261
19.07.2024	41.5	59.1	12.6	14.6	0.270
30.07.2024	38.4	61.2	16.3	17.5	0.225
Max	41.7	63.1	16.7	17.8	0.270
Min	37.6	55.3	12.6	14.6	0.225
Avg	39.9	60.3	14.9	16.5	0.251
98%ile	41.7	63.0	16.7	17.8	0.270
CHP area – AAQ2					
03.07.2024	46.9	70.2	12.7	16.7	0.281
05.07.2024	42.3	72.1	16.8	18.6	0.276
09.07.2024	40.5	69.3	13.4	14.7	0.297
12.07.2024	43.3	65.3	17.7	18.1	0.307
19.07.2024	46.2	71.7	13.9	14.9	0.282
30.07.2024	42.6	67.4	16.2	17.4	0.246
Max	46.9	72.1	17.7	18.6	0.307
Min	40.5	65.3	12.7	14.7	0.246
Avg	43.6	69.3	15.1	16.7	0.282
98%ile	46.8	72.1	17.6	18.6	0.306
Limits as per NAAQS	60	100	80	80	02
Test Methods	Gravimetric Method		Improved West & Geake Method	Modified Jacob & Hochheiser Method	NDIR spectroscopy method

Teflon filter paper was used in PM2.5 & whatman filter paper for PM10 weighed in Mettler electronic balance and computed as per standard methods PM2.5, PM10, SO₂, NO_x is monitored on 24 hrs. Basis CO is monitored on 8 hours basis All the values are expressed in µg/m³ except CO is measured in mg/m³


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TABLE-7
AAQ MONITORING RESULTS

Monitoring Date	PM2.5	PM10	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³
	Particulate Matter(µg/m ³)				
DM plant area – AAQ3					
03.07.2024	42.6	60.0	12.9	14.4	0.253
05.07.2024	37.9	65.3	14.2	16.6	0.251
09.07.2024	36.1	54.9	13.2	13.7	0.247
12.07.2024	40.6	57.3	13.4	15.3	0.241
19.07.2024	38.9	59.5	14.2	13.1	0.236
30.07.2024	43.2	52.0	12.8	16.3	0.246
Max	43.2	65.3	14.2	16.6	0.253
Min	36.1	52.0	12.8	13.1	0.236
Avg	39.9	58.2	13.5	14.9	0.246
98%ile	43.1	64.8	14.2	16.6	0.253
Ash handling area – AAQ4					
03.07.2024	42.1	67.8	16.7	15.4	0.301
05.07.2024	44.8	73.2	17.2	19.5	0.326
09.07.2024	42.8	75.1	16.3	15.9	0.305
12.07.2024	43.7	62.6	15.7	17.0	0.350
19.07.2024	47.6	75.7	17.4	15.2	0.309
30.07.2024	45.6	61.8	16.2	18.6	0.316
Max	47.6	75.7	17.4	19.5	0.350
Min	42.1	61.8	15.7	15.2	0.301
Avg	44.4	69.4	16.6	16.9	0.318
98%ile	47.4	75.6	17.4	19.4	0.348
Tarod Village – AAQ5					
03.07.2024	27.5	59.0	12.6	13.7	0.192
05.07.2024	30.1	55.4	13.5	14.6	0.170
09.07.2024	27.2	58.3	10.5	15.2	0.144
12.07.2024	31.8	60.5	12.5	13.9	0.162
19.07.2024	29.7	57.3	11.3	13.2	0.196
30.07.2024	33.2	59.3	12.3	14.1	0.177
Max	33.2	60.5	13.5	15.2	0.196
Min	27.2	55.4	10.5	13.2	0.144
Avg	29.9	58.3	12.1	14.1	0.174
98%ile	33.1	60.4	13.4	15.1	0.196
Jhalmala Village- AAQ6					
03.07.2024	32.6	55.9	10.8	13.3	0.171
05.07.2024	29.8	58.6	12.4	14.0	0.184
09.07.2024	32.2	54.4	9.6	13.1	0.158
12.07.2024	30.1	56.6	11.5	13.6	0.167
19.07.2024	27.5	53.2	10.4	13.7	0.136
30.07.2024	29.8	56.1	11.5	14.4	0.144
Max	32.6	58.6	12.4	14.4	0.184
Min	27.5	53.2	9.6	13.1	0.136
Avg	30.3	55.8	11.0	13.7	0.160
98%ile	32.6	58.4	12.3	14.4	0.183
Limits as per NAAQS	60	100	80	80	02


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TABLE-8
AAQ MONITORING RESULTS

Monitoring Date	PM2.5	PM10	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³
	Particulate				
Amora Village - AAQ7					
03.07.2024	30.2	54.3	10.7	12.6	0.128
05.07.2024	31.5	58.3	12.4	13.8	0.155
09.07.2024	32.6	54.0	9.6	12.5	0.162
12.07.2024	27.7	55.4	11.6	14.2	0.158
19.07.2024	30.5	52.4	10.3	12.0	0.141
30.07.2024	29.8	57.6	11.8	13.7	0.167
Max	32.6	58.3	12.4	14.2	0.167
Min	27.7	52.4	9.6	12.0	0.128
Avg	30.4	55.3	11.1	13.1	0.152
98%ile	32.5	58.2	12.3	14.2	0.167
Sonsari Village - AAQ8					
03.07.2024	28.4	57.8	12.1	12.5	0.133
05.07.2024	29.0	55.7	12.0	13.7	0.147
09.07.2024	34.2	56.9	9.4	11.3	0.154
12.07.2024	30.9	57.8	12.1	13.6	0.136
19.07.2024	32.2	55.7	11.1	13.3	0.124
30.07.2024	29.8	50.8	12.3	14.0	0.131
Max	34.2	57.8	12.3	14.0	0.154
Min	28.4	50.8	9.4	11.3	0.124
Avg	30.8	55.8	11.5	13.1	0.138
98%ile	34.0	57.8	12.3	14.0	0.153
Nariyara Village – AAQ9					
03.07.2024	31.4	56.2	11.5	14.7	0.153
05.07.2024	28.5	54.8	12.3	13.5	0.145
09.07.2024	30.1	52.8	13.1	15.0	0.126
12.07.2024	31.4	48.2	10.2	13.7	0.154
19.07.2024	28.3	55.6	9.8	13.2	0.137
30.07.2024	27.4	50.3	12.1	14.1	0.151
Max	31.4	56.2	13.1	15.0	0.154
Min	27.4	48.2	9.8	13.2	0.126
Avg	29.5	53.0	11.5	14.0	0.144
98%ile	31.4	56.1	13.0	15.0	0.154
Limits as per NAAQS	60	100	80	80	02

Teflon filter paper was used in PM2.5 & whatman filter paper for PM10 weighed in Mettler electronic balance and computed as per standard methods PM2.5, PM10, SO₂, NO_x is monitored on 24 hrs. Basis CO is monitored on 8 hours basis All the values are expressed in µg/m³ except CO is measured in mg/m³


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TABLE-9
AAQ MONITORING RESULTS

Monitoring Date & Location	Arsenic ng/m ³	Nickel ng/m ³	Lead µg/m ³	O ₃ µg/m ³	NH ₃ µg/m ³	C ₆ H ₆ µg/m ³	Benzo(a) Pyrene ng/m ³	Hg µg/m ³
BTG area – AAQ1								
03.07.2024	<1.0	<1.0	0.002	8.0	<20	<1.0	<0.1	<0.001
05.07.2024	<1.0	1.5	0.001	9.5	<20	<1.0	<0.1	<0.001
09.07.2024	<1.0	1.2	<0.001	7.3	<20	<1.0	<0.1	<0.001
12.07.2024	<1.0	<1.0	0.003	10.2	<20	<1.0	<0.1	<0.001
19.07.2024	<1.0	1.0	0.004	9.5	<20	<1.0	<0.1	<0.001
30.07.2024	<1.0	1.3	0.001	10.1	<20	<1.0	<0.1	<0.001
Max	<1.0	1.5	0.004	10.2	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	7.3	<20	<1.0	<0.1	<0.001
Avg	<1.0	1.3	0.002	9.1	<20	<1.0	<0.1	<0.001
98%	<1.0	1.5	0.004	10.2	<20	<1.0	<0.1	<0.001
CHP area – AAQ2								
03.07.2024	<1.0	1.3	0.003	9.7	<20	<1.0	<0.1	<0.001
05.07.2024	<1.0	<1.0	0.001	12.7	<20	<1.0	<0.1	<0.001
09.07.2024	<1.0	2.3	<0.001	12.3	<20	<1.0	<0.1	<0.001
12.07.2024	<1.0	1.7	0.002	10.7	<20	<1.0	<0.1	<0.001
19.07.2024	<1.0	2.6	0.004	14.6	<20	<1.0	<0.1	<0.001
30.07.2024	<1.0	1.5	0.002	13.1	<20	<1.0	<0.1	<0.001
Max	<1.0	2.6	0.004	14.6	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	9.7	<20	<1.0	<0.1	<0.001
Avg	<1.0	1.9	0.002	12.2	<20	<1.0	<0.1	<0.001
98%ile	<1.0	2.6	0.004	14.5	<20	<1.0	<0.1	<0.001
DM plant area – AAQ3								
03.07.2024	<1.0	1.2	0.001	10.3	<20	<1.0	<0.1	<0.001
05.07.2024	<1.0	1.6	<0.001	9.7	<20	<1.0	<0.1	<0.001
09.07.2024	<1.0	1.1	0.002	7.9	<20	<1.0	<0.1	<0.001
12.07.2024	<1.0	<1.0	0.001	11.3	<20	<1.0	<0.1	<0.001
19.07.2024	<1.0	1.3	<0.001	10.4	<20	<1.0	<0.1	<0.001
30.07.2024	<1.0	1.7	0.003	11.3	<20	<1.0	<0.1	<0.001
Max	<1.0	1.7	0.003	11.3	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	7.9	<20	<1.0	<0.1	<0.001
Avg	<1.0	1.4	0.002	10.2	<20	<1.0	<0.1	<0.001
98%	<1.0	1.7	0.003	11.3	<20	<1.0	<0.1	<0.001

Below Detectable Limit for as and Ni 1.0 ng/m³ Below Detectable Limit for Pb 0.001 µg/m³ Ozone and CO is monitored on 8 hours basis Below Detectable Limit for O₃ 50 µg/m³ Below Detectable Limit for NH₃ 20 µg/m³


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TABLE-10
AAQ MONITORING RESULTS

Monitoring Date & Location	Arsenic ng/m ³	Nickel ng/m ³	Lead µg/m ³	O ₃ µg/m ³	NH ₃ µg/m ³	C ₆ H ₆ µg/m ³	Benzo(a) Pyrene ng/m ³	Hg µg/m ³
Ash handling area – AAQ4								
03.07.2024	<1.0	1.6	0.002	10.4	<20	<1.0	<0.1	<0.001
05.07.2024	<1.0	1.2	0.005	11.6	<20	<1.0	<0.1	<0.001
09.07.2024	<1.0	<1.0	<0.001	9.3	<20	<1.0	<0.1	<0.001
12.07.2024	<1.0	2.4	0.003	13.4	<20	<1.0	<0.1	<0.001
19.07.2024	<1.0	1.7	0.001	11.1	<20	<1.0	<0.1	<0.001
30.07.2024	<1.0	1.3	0.004	12.2	<20	<1.0	<0.1	<0.001
Max	<1.0	2.4	0.005	13.4	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	9.3	<20	<1.0	<0.1	<0.001
Avg	<1.0	1.6	0.003	11.3	<20	<1.0	<0.1	<0.001
98%	<1.0	2.3	0.005	13.3	<20	<1.0	<0.1	<0.001
Tarod Village – AAQ5								
03.07.2024	<1.0	<1.0	<0.001	7.2	<20	<1.0	<0.1	<0.001
05.07.2024	<1.0	<1.0	<0.001	5.8	<20	<1.0	<0.1	<0.001
09.07.2024	<1.0	<1.0	<0.001	6.3	<20	<1.0	<0.1	<0.001
12.07.2024	<1.0	<1.0	<0.001	7.4	<20	<1.0	<0.1	<0.001
19.07.2024	<1.0	<1.0	<0.001	7.1	<20	<1.0	<0.1	<0.001
30.07.2024	<1.0	<1.0	<0.001	7.9	<20	<1.0	<0.1	<0.001
Max	<1.0	<1.0	<0.001	7.9	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	5.8	<20	<1.0	<0.1	<0.001
Avg	<1.0	<1.0	<0.001	7.0	<20	<1.0	<0.1	<0.001
98%	<1.0	<1.0	<0.001	7.9	<20	<1.0	<0.1	<0.001
Jhalmala Village- AAQ-6								
03.07.2024	<1.0	<1.0	<0.001	5.8	<20	<1.0	<0.1	<0.001
05.07.2024	<1.0	<1.0	<0.001	6.3	<20	<1.0	<0.1	<0.001
09.07.2024	<1.0	<1.0	<0.001	5.5	<20	<1.0	<0.1	<0.001
12.07.2024	<1.0	<1.0	<0.001	6.9	<20	<1.0	<0.1	<0.001
19.07.2024	<1.0	<1.0	<0.001	7.4	<20	<1.0	<0.1	<0.001
30.07.2024	<1.0	<1.0	<0.001	7.8	<20	<1.0	<0.1	<0.001
Max	<1.0	<1.0	<0.001	7.8	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	5.5	<20	<1.0	<0.1	<0.001
Avg	<1.0	<1.0	<0.001	6.6	<20	<1.0	<0.1	<0.001
98%	<1.0	<1.0	<0.001	7.9	<20	<1.0	<0.1	<0.001
Limits as per	06	20	1.0	100	400	05	01	-

Below Detectable Limit for as and Ni 1.0 ng/m³, Below Detectable Limit for Pb 0.001 µg/m³ Ozone and CO is monitored on 8 hours basis Below Detectable Limit for O₃ 50 µg/m³ Below Detectable Limit for NH₃ 20 µg/m³



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TABLE-11
AAQ MONITORING RESULTS

Monitoring Date & Location	Arsenic ng/m ³	Nickel ng/m ³	Lead µg/m ³	O ₃ µg/m ³	NH ₃ µg/m ³	C ₆ H ₆ µg/m ³	Benzo(a) Pyrene ng/m ³	Hg µg/m ³
Amora Village – AAQ7								
03.07.2024	<1.0	<1.0	<0.001	5.6	<20	<1.0	<0.1	<0.001
05.07.2024	<1.0	<1.0	<0.001	6.4	<20	<1.0	<0.1	<0.001
09.07.2024	<1.0	<1.0	<0.001	4.3	<20	<1.0	<0.1	<0.001
12.07.2024	<1.0	<1.0	<0.001	6.2	<20	<1.0	<0.1	<0.001
19.07.2024	<1.0	<1.0	<0.001	7.4	<20	<1.0	<0.1	<0.001
30.07.2024	<1.0	<1.0	<0.001	6.4	<20	<1.0	<0.1	<0.001
Max	<1.0	<1.0	<0.001	7.4	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	4.3	<20	<1.0	<0.1	<0.001
Avg	<1.0	<1.0	<0.001	6.1	<20	<1.0	<0.1	<0.001
98%ile	<1.0	<1.0	<0.001	7.3	<20	<1.0	<0.1	<0.001
Sonsari Village – AAQ8								
03.07.2024	<1.0	<1.0	<0.001	6.8	<20	<1.0	<0.1	<0.001
05.07.2024	<1.0	<1.0	<0.001	4.9	<20	<1.0	<0.1	<0.001
09.07.2024	<1.0	<1.0	<0.001	6.7	<20	<1.0	<0.1	<0.001
12.07.2024	<1.0	<1.0	<0.001	5.9	<20	<1.0	<0.1	<0.001
19.07.2024	<1.0	<1.0	<0.001	4.8	<20	<1.0	<0.1	<0.001
30.07.2024	<1.0	<1.0	<0.001	5.8	<20	<1.0	<0.1	<0.001
Max	<1.0	<1.0	<0.001	6.8	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	4.8	<20	<1.0	<0.1	<0.001
Avg	<1.0	<1.0	<0.001	5.8	<20	<1.0	<0.1	<0.001
98%	<1.0	<1.0	<0.001	6.8	<20	<1.0	<0.1	<0.001
Nariyara Village – AAQ9								
03.07.2024	<1.0	<1.0	<0.001	6.7	<20	<1.0	<0.1	<0.001
05.07.2024	<1.0	<1.0	<0.001	7.3	<20	<1.0	<0.1	<0.001
09.07.2024	<1.0	<1.0	<0.001	8.6	<20	<1.0	<0.1	<0.001
12.07.2024	<1.0	<1.0	<0.001	7.6	<20	<1.0	<0.1	<0.001
19.07.2024	<1.0	<1.0	<0.001	8.4	<20	<1.0	<0.1	<0.001
30.07.2024	<1.0	<1.0	<0.001	9.1	<20	<1.0	<0.1	<0.001
Max	<1.0	<1.0	<0.001	9.1	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	6.7	<20	<1.0	<0.1	<0.001
Avg	<1.0	<1.0	<0.001	8.0	<20	<1.0	<0.1	<0.001
98%	<1.0	<1.0	<0.001	9.1	<20	<1.0	<0.1	<0.001
Limits as per NAAQS	06	20	1.0	100	400	05	01	-

Below Detectable Limit for as and Ni 1.0 ng/m³, Below Detectable Limit for Pb 0.001 µg/m³ Ozone and CO is monitored on 8 hours basis Below Detectable Limit for O₃ 50 µg/m³ Below Detectable Limit for NH₃ 20 µg/m³

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7.1.1 Observations (Inside the premises)

PM2.5: The maximum value for PM2.5 observed at AHP area as 47.6 $\mu\text{g}/\text{m}^3$ and minimum value for PM2.5 at DM plant area as 36.1 $\mu\text{g}/\text{m}^3$. The 24 hours applicable limit inside the plant premises 60 $\mu\text{g}/\text{m}^3$ for industrial area.

PM10: The maximum value for PM10 observed at AHP area as 75.7 $\mu\text{g}/\text{m}^3$ and minimum value for PM10 at DM Plant area as 52.0 $\mu\text{g}/\text{m}^3$. The 24 hours applicable limit inside the plant premises 100 $\mu\text{g}/\text{m}^3$ for industrial area.

SO₂: The maximum value for SO₂ observed at CHP plant area as 17.7 $\mu\text{g}/\text{m}^3$ and minimum value for SO₂ at DM Plant area as 12.6 $\mu\text{g}/\text{m}^3$. The 24 hours applicable limit inside the plant premises 80 $\mu\text{g}/\text{m}^3$ for industrial area.

NO₂: The maximum value for NO₂ observed at AHP area as 19.5 $\mu\text{g}/\text{m}^3$ and minimum value for NO₂ at DM Plant area as 13.1 $\mu\text{g}/\text{m}^3$. The 24 hours applicable limit inside the plant premises 80 $\mu\text{g}/\text{m}^3$ for industrial area.

CO: The maximum value for CO observed at AHP area as 0.350 mg/m^3 and minimum value for CO at BTG plant as 0.225 mg/m^3 . The 8 hours applicable limit inside the plant premises 02 mg/m^3 for industrial area.

Ammonia: The maximum and minimum value for Ammonia observed at all the locations as <20 $\mu\text{g}/\text{m}^3$. The 24 hours' applicable limit inside the plant premises 400 $\mu\text{g}/\text{m}^3$ for industrial area

Nickel: The maximum value for Nickel observed at CHP area as 2.6 ng/m^3 and <1.0 ng/m^3 minimum value for BTG, DM, CHP & AHP Plant area. The 24 hours' applicable limit inside the plant premises 20 ng/m^3 for industrial area.


Arsenic: The maximum and minimum value for Arsenic observed at all the locations as <1.0 ng/m^3 . The 24 hours applicable limit inside the plant premises 6 ng/m^3 for industrial area

Lead: The maximum value for Lead observed at AHP area as 0.005 $\mu\text{g}/\text{m}^3$ and minimum value for BTG, DM, CHP & AHP Plant area as <0.001 $\mu\text{g}/\text{m}^3$. The 24 hours' applicable limit inside the plant premises 1 $\mu\text{g}/\text{m}^3$ for industrial area.

Ozone: The maximum value for Ozone observed at CHP area as 14.6 $\mu\text{g}/\text{m}^3$ and minimum value for Ozone BTG Plant area as 7.3 $\mu\text{g}/\text{m}^3$. The 8 hours' applicable limit inside the plant premises 100 $\mu\text{g}/\text{m}^3$ for industrial area.

Benzo(a)Pyrene: The maximum and minimum value for Benzo(a)Pyrene observed at all the locations as <0.1 ng/m^3 . The 24 hours applicable limit inside the plant premises 1 ng/m^3 for industrial area

Benzene: The maximum and minimum value for Benzene observed at all the locations as <1.0 $\mu\text{g}/\text{m}^3$. The 24 hours applicable limit inside the plant premises 5 $\mu\text{g}/\text{m}^3$ for industrial area

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Mercury: The maximum and minimum value for Mercury observed at all the locations as $<0.001 \mu\text{g} / \text{m}^3$ for 24 hours.

7.1.2 Observations (Outside the premises)

PM_{2.5}: The maximum value for PM_{2.5} observed at Sonsari village as $34.2 \mu\text{g} / \text{m}^3$ and minimum value for PM_{2.5} at Nariyara village as $26.3 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $60 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

PM₁₀: The maximum value for PM₁₀ observed at Tarod village as $60.5 \mu\text{g} / \text{m}^3$ and minimum value for PM₁₀ at Nariyara village as $48.2 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $100 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

SO₂: The maximum value for SO₂ observed at Tarod village as $13.5 \mu\text{g} / \text{m}^3$ and minimum value for SO₂ at Sonsari village as $9.4 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the Plant premises $80 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

NO_x: The maximum value for NO_x observed at Tarod village as $15.2 \mu\text{g} / \text{m}^3$ and minimum value for NO_x at Amora village as $12.0 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $80 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

CO: The maximum value for CO observed at Tarod village as $0.196 \text{ mg} / \text{m}^3$ and minimum value for CO at Sonsari village as $0.124 \text{ mg} / \text{m}^3$. The 8 hours' applicable limit outside the plant premises $02 \text{ mg} / \text{m}^3$ for Rural/Residential area.

Ammonia: The maximum and minimum value for Ammonia observed at all the locations as $<20 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $400 \mu\text{g} / \text{m}^3$ for Rural/Residential area.


Nickel: The maximum and minimum value for Nickel observed at all the locations as $<1.0 \text{ ng} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $20 \text{ ng} / \text{m}^3$ for Rural/Residential area.

Arsenic: The maximum and minimum value for Arsenic observed at all the locations as $<1.0 \text{ ng} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $6 \text{ ng} / \text{m}^3$ for Rural/Residential area

Lead: The maximum and minimum value for Lead observed at all the locations as $<0.001 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $1 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

Ozone: The maximum value for Ozone observed at Nariyara village as $9.1 \mu\text{g} / \text{m}^3$ and minimum value for Ozone at Amora village as $4.3 \mu\text{g} / \text{m}^3$. The 8 hours applicable limit outside the plant premises $100 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

Benzo(a)Pyrene: The maximum and minimum value for Benzo(a)Pyrene observed at all the locations as $<0.1 \text{ ng} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $1 \text{ ng} / \text{m}^3$ for Rural/Residential area

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Benzene: The maximum and minimum value for Benzene observed at all the locations as $<1.0 \mu\text{g}/\text{m}^3$. The 24 hours applicable limit outside the plant premises $5 \mu\text{g}/\text{m}^3$ for Rural/Residential area

Mercury: The maximum and minimum value for Mercury observed at all the locations as $<0.001 \mu\text{g}/\text{m}^3$ for 24 hours.

7.1.2 Results and conclusions:

The results of the monitored data indicate that the ambient air quality of the region in general is conformity with respect to norms of National Ambient Air Quality standards of CPCB, at all locations monitored.

7.2 **Noise Monitoring**

7.2.1 Source Noise Monitoring – Inside the Plant Premises

The spot noise levels observed inside the premises at various locations is given in **Table-12**

TABLE-12
INDUSTRIAL NOISE LEVELS IN WORK ENVIRONMENT

Sr. No	Code	Location	Date of sampling	Noise Level L_{eq} [dB(A)]
1	N1	TG floor	01/07/2024	69.3
2	N2	Cooling tower#3	01/07/2024	66.8
3	N3	Main Gate	08/07/2024	67.4
4	N4	Boiler feed pump	01/07/2024	81.6
5	N5	Admin Building area	08/07/2024	52.5
6	N6	CHP Machine area	08/07/2024	82.0
7	N7	AHP area	08/07/2024	71.4
8	N8	Ash Silo area	08/07/2024	72.6
9	N9	CW Pump house	01/07/2024	83.8
10	N10	Compressor 1	06/07/2024	82.5
11	N11	Compressor 2	06/07/2024	83.5
12	N12	Compressor 3	06/07/2024	84.0
13	N13	Compressor 4	06/07/2024	83.8

7.2.1.1 Observations

The industrial noise levels within the premises at Work Zone area are observed to be in the range of 52.5 to 84.0 dB (A), which are within the prescribed limit of 85 dB (A).

7.2.3 Noise Monitoring – Outside the Premises

The statistical analysis is done for measured noise levels at four locations in the study area. The parameters are analyzed for L_{day} , L_{night} , and L_{dn} . The statistical analysis results are given in **Table-13**.

TABLE-13
AMBIENT NOISE LEVELS IN THE STUDY AREA

All the values are given in dB (A)

Code	Location	Date of sampling	L_{10}	L_{50}	L_{90}	L_{eq}	L_{day}	L_{night}	L_{dn}
N14	Banahill Village	03.07.2024	55.2	51.3	47.6	52.3	53.1	43.5	50.2
N15	Tarod Village	30.07.2024	53.1	49.2	45.5	50.2	51.0	42.2	48.5
N16	Rogda Village	26.07.2024	51.8	47.9	44.2	48.9	49.7	40.7	46.8
N17	Jhalmala Village	05.07.2024	52.6	48.7	45.0	49.7	50.5	41.5	47.3
N18	Nariyara Village	09.07.2024	53.5	49.6	45.9	50.6	51.4	42.7	48.1
N19	Sonsari Village	12.07.2024	54.6	50.7	47.0	51.7	52.5	43.0	49.7
N20	Amora Village	23.07.2024	52.7	48.8	45.1	49.8	50.6	42.4	47.5
N21	Arasmeta Village	19.07.2024	55.0	51.1	47.4	52.1	52.9	43.7	49.4

7.2.3.1 Observations

a) Day time Noise Levels (L_{day})

Residential Area

The daytime (L_{day}) noise levels are observed to be in the range of 53.1 dB (A) – 49.7 dB (A), which are within the prescribed limit of 55 dB (A).

b) Night time Noise Levels (L_{night})

Residential Area

The nighttime (L_{night}) noise levels were observed to be in the range of 43.7 dB (A) – 40.7 dB (A), which are within the prescribed limit of 45 dB (A).

7.3 Ground Water Quality

Four ground water samples were collected around Ash pond area and four ground water samples were collected at villages around the plant site and analyzed for various parameters. The analytical results are presented below in **Table-14** and **Table-15**.


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TABLE-14
GROUND WATER QUALITY AROUND ASHPOND

Sr. No	Parameter	Units	GW1	GW2	GW3	GW4	Limits as per IS:10500
	Sampling season		Monsoon Season				
	Sampling date		11.07.2024	11.07.2024	11.07.2024	11.07.2024	
	Date of analysis		13.07.2024	13.07.2024	13.07.2024	13.07.2024	
1	pH	--	7.32	7.66	7.34	7.53	6.5 – 8.5 (NR)
2	Color	Hazen	7	12	7	10	5(15)
3	Taste	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Odour	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Conductivity	µs/cm	874	935	1005	1137	\$
6	Turbidity	NTU	3	4	5	4	1(5)
7	Total Dissolved Solids	mg/l	558	607	663	746	500(2000)
8	Total Hardness as CaCO ₃	mg/l	255	274	303	354	200(600)
9	Total Alkalinity as CaCO ₃	mg/l	175.2	187.4	193.5	224.5	200(600)
10	Calcium as Ca ²⁺	mg/l	57.9	60.8	65.6	71.6	75(200)
11	Magnesium as Mg ²⁺	mg/l	26.8	29.6	33.8	42.5	30(100)
12	Residual Chlorine	mg/l	<0.2	<0.2	<0.2	<0.2	0.2(1)
13	Boron as B	mg/l	0.6	0.4	0.7	0.5	0.5(1)
14	Chloride as Cl ⁻	mg/l	134.8	149.6	163.4	175.7	250(1000)
15	Sulphate as SO ₄ ²⁺	mg/l	61.5	56.4	64.8	76.6	200(400)
16	Fluorides as F	mg/l	0.5	0.7	0.8	1.3	1.0(1.5)
17	Nitrate as NO ₃	mg/l	7.6	10.6	13.2	16.4	45(NR)
18	Sodium as Na ⁺	mg/l	77.9	80.1	82.6	89.7	\$
19	Potassium as K ⁺	mg/l	9.8	10.8	15.8	15.6	\$
20	Phenolic Compounds	mg/l	<0.001	<0.001	<0.001	<0.001	0.001(0.002)
21	Cyanides as CN	mg/l	<0.02	<0.02	<0.02	<0.02	0.05 (NR)
22	Anionic Detergents	mg/l	<0.1	<0.1	<0.1	<0.1	0.2 (1.0)
23	Mineral Oil	mg/l	<0.01	<0.01	<0.01	<0.01	0.5 (NR)
24	Cadmium as Cd	mg/l	<0.001	<0.001	<0.001	<0.001	0.003 (NR)
25	Total Arsenic as As	mg/l	<0.01	<0.01	<0.01	<0.01	0.01 (0.05)
26	Copper as Cu	mg/l	<0.01	<0.01	<0.01	<0.01	0.05 (1.5)
27	Led as Pb	mg/l	<0.01	<0.01	<0.01	<0.01	0.01 (NR)
28	Manganse as Mn	mg/l	<0.01	<0.01	<0.01	<0.01	0.1 (0.3)
29	Iron as Fe	mg/l	0.05	0.06	0.04	0.09	0.3(NR)
30	Total Chromium (as Cr)	mg/l	<0.05	<0.05	<0.05	<0.05	0.05(NR)
31	Selenium as Se	mg/l	<0.01	<0.01	<0.01	<0.01	0.01(NR)
32	Zinc as Zn	mg/l	0.46	0.32	0.26	0.36	5(15)
33	Aluminium as Al	mg/l	<0.01	<0.01	<0.01	<0.01	0.03(0.2)
34	Mercury as Hg	mg/l	<0.001	<0.001	<0.001	<0.001	0.001(NR)
35	Pesticides	mg/l	Absent	Absent	Absent	Absent	Absent
36	E. Coli	--	Absent	Absent	Absent	Absent	Absent
37	Total Coliforms	MPN/100ml	Absent	Absent	Absent	Absent	10

Note: \$ - Limits not specified; NR - No Relaxation

Limits are shown in IS 10500 are Acceptable limits (Requirement) and in parenthesis are Permissible limit in absence of alternate source

Sampling Locations

GW1. Ash pond Location-1, GW2. Ash pond Location-2, GW3. Ash pond Location-3, GW4. Ash pond Location-4

7.3.1 Observations

7.3.2.1 Ground Water Quality

The analysis results indicate that the pH and conductivity of the ground water was found to be in the range of 7.32– 7.66 and 874 to 1137 µS/cm. The Total Dissolved Solids were found to be well within the limits ranging from 558 to 746 mg/L. Other parameters like Chlorides, Sulphates, Nitrates and Fluorides were observed to be well within the prescribed limits. The overall physico-chemical analysis of all the parameters is well within the standards as per IS: 10500.


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TABLE-15
GROUND WATER QUALITY IN STUDY AREA

Sr. No	Parameter	Units	GW1	GW2	GW3	GW4	Limits as per IS:10500
	Sampling season		Monsoon Season				
	Sampling date		10.07.2024	10.07.2024	10.07.2024	10.07.2024	
	Date of analysis		13.07.2024	13.07.2024	13.07.2024	13.07.2024	
1	pH	--	7.43	7.36	7.50	7.26	6.5 – 8.5 (NR)
2	Color	Hazen	<1.0	<1.0	<1.0	<1.0	5(15)
3	Taste	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Odour	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Conductivity	µs/cm	969	1057	644	1521	\$
6	Turbidity	NTU	<1.0	<1.0	<1.0	<1.0	1(5)
7	Total Dissolved Solids	mg/l	610	676	399	988	500(2000)
8	Total Hardness as CaCO ₃	mg/l	287	320	206	464	200(600)
9	Total Alkalinity as CaCO ₃	mg/l	193.6	205.2	189.6	327.5	200(600)
10	Calcium as Ca ²⁺	mg/l	62.5	67.8	39.2	99.2	75(200)
11	Magnesium as Mg ²⁺	mg/l	31.7	36.5	26.3	52.6	30(100)
12	Residual Chlorine	mg/l	<0.2	<0.2	<0.2	<0.2	0.2(1)
13	Boron as B	mg/l	0.02	0.05	0.06	0.03	0.5(1)
14	Chloride as Cl ⁻	mg/l	152.7	169.2	58.6	205.4	250(1000)
15	Sulphate as SO ₄ ²⁺	mg/l	59.3	68.5	38.6	122.8	200(400)
16	Fluorides as F	mg/l	0.8	1.1	0.4	0.7	1.0(1.5)
17	Nitrate as NO ₃	mg/l	12.4	13.1	10.3	15.6	45(NR)
18	Sodium as Na ⁺	mg/l	83.6	85.2	47.5	122.5	\$
19	Potassium as K ⁺	mg/l	12.7	18.6	9.7	23.6	\$
20	Phenolic Compounds	mg/l	<0.001	<0.001	<0.001	<0.001	0.001(0.002)
21	Cyanides as CN	mg/l	<0.02	<0.02	<0.02	<0.02	0.05 (NR)
22	Anionic Detergents	mg/l	<0.1	<0.1	<0.1	<0.1	0.2 (1.0)
23	Mineral Oil	mg/l	<0.01	<0.01	<0.01	<0.01	0.5 (NR)
24	Cadmium as Cd	mg/l	<0.001	<0.001	<0.001	<0.001	0.003 (NR)
25	Total Arsenic as As	mg/l	<0.01	<0.01	<0.01	<0.01	0.01 (0.05)
26	Copper as Cu	mg/l	<0.01	<0.01	<0.01	<0.01	0.05 (1.5)
27	Lead as Pb	mg/l	<0.01	<0.01	<0.01	<0.01	0.01 (NR)
28	Manganese as Mn	mg/l	<0.01	<0.01	<0.01	<0.01	0.1 (0.3)
29	Iron as Fe	mg/l	0.05	0.07	0.04	0.08	0.3(NR)
30	Total Chromium (as Cr)	mg/l	<0.05	<0.05	<0.05	<0.05	0.05(NR)
31	Selenium as Se	mg/l	<0.01	<0.01	<0.01	<0.01	0.01(NR)
32	Zinc as Zn	mg/l	0.14	0.25	0.21	0.16	5(15)
33	Aluminium as Al	mg/l	<0.01	<0.01	<0.01	<0.01	0.03(0.2)
34	Mercury as Hg	mg/l	<0.001	<0.001	<0.001	<0.001	0.001(NR)
35	Pesticides	mg/l	Absent	Absent	Absent	Absent	Absent
36	E. Coli	--	Absent	Absent	Absent	Absent	Absent
37	Total Coliforms	MPN/100ml	Absent	Absent	Absent	Absent	10

Note: \$ - Limits not specified; NR - No Relaxation Limits are shown in IS 10500 are Acceptable limits (Requirement) and in parenthesis are Permissible limit in absence of alternate source

Sampling Locations

GW1. Amora Village (Bore well) , GW2. Rogda (Bore well)
GW3. Banahill (Bore well) , GW4. Nariyara Village (Bore well)

7.3.1 Observations

7.3.2.1 Ground Water Quality

The analysis results indicate that the pH and conductivity of the ground water was found to be in the range of 7.26 - 7.50 and 644 to 1521 µS/cm. The Total Dissolved Solids were found to be well within the limits ranging from 399 to 988 mg/L. Other parameters like Chlorides, Sulphates, Nitrates and Fluorides were observed to be well within the prescribed limits. The overall physico-chemical analysis of all the parameters is well within the standards as per IS: 10500.

7.4 Waste Water Quality

Four waste water samples were collected within the plant site and analyzed for various parameters. The analytical results are presented below in **Table-16**.

TABLE-16
WASTE WATER QUALITY


Sr. No.	Parameters	Units	CT Blow Down	Boiler Blow Down	Condenser Cooling water	Guard Pond	Limits as per CECB& CPCB
			WW1	WW2	WW3	WW4	
	Sampling Date		11.07.2024	11.07.2024	11.07.2024	11.07.2024	
	Date of Analysis		13.07.2024	13.07.2024	13.07.2024	13.07.2024	
1	p ^H	-	7.57	7.47	8.21	6.98	6.5-8.5
	Temperature	°C	28.5	29.2	28.8	27.7	
3	Total Dissolved Solids	mg/l	682	23	6.6	756	-
4	Total Suspended Solids	mg/l	23.2	<1.0	<1.0	53.2	100
5	Dissolved Oxygen	mg/l	5.3	5.1	5.5	5.2	-
6	Biochemical Oxygen Demand, (3 days at 27°C)	mg/l	<3	<3	<3	<3	-
7	Chemical Oxygen Demand	mg/l	<5	<5	<5	47	-
8	Chlorides	mg/l	78.3	23.2	18.4	144.2	-
9	Sulphates	mg/l	66.4	33.4	37.4	127.4	-
10	Phosphates	mg/l	0.45	<0.01	<0.01	0.95	5.0
11	Zinc	mg/l	0.08	<0.01	<0.01	0.42	1.0
12	Chromium	mg/l	<0.01	<0.01	<0.01	<0.01	0.2
13	Copper	mg/l	<0.01	<0.01	<0.01	<0.01	1.0
14	Free Available chlorine	mg/l	<0.2	<0.2	<0.2	<0.2	0.5
15	Irons	mg/l	<0.01	<0.01	<0.01	0.21	1.0
16	Oil & Grease	mg/l	<1.0	<1.0	<1.0	<1.0	20

7.4.1 Results and Conclusions

The data analysis to be as per CFO Norms and analytical results indicated that the guard pond waste water is well within the standard limits specified by EPA Notification [G.S.R.7, dt. Dec.22,1998].

7.4.2 Observations-Waste water quality.

The analysis results indicate that the pH ranges from 7.47 – 8.21 and the Total Suspended Solids were found to be within the limits ranging from <1.0-53.2 mg/l. Other parameters like Zinc, Chromium, Available, chloride, Iron and Oil& Grease were observed to be well within the prescribed limits.

 KSK Power from knowledge	Monthly Environmental Monitoring Report for 6x600 MW Coal Based Power Plant of KSK Mahanadi Power Company Limited at Nariyara Village, Janjgir-Champa District, Chhattisgarh <p style="text-align: right;">July 2024</p>
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7.4.3 Sewage Waste Water Quality

One Sewage water samples is collected and analyzed for various parameters. The survey analytical results are given in **Table-17**.

TABLE-17
SEWAGE WASTE WATER QUALITY


Sr.No	Parameter	UOM	WW5 (STP Outlet)
	Sampling Date		11.07.2024
	Date of Analysis		13.07.2024
1	pH	-	7.21
2	Total Dissolved Solids	mg/l	665
3	Total Suspended Solids	mg/l	33.2
4	Dissolved Oxygen	mg/l	5.0
5	Bio Chemical Oxygen Demand for 3 day 27°C	mg/l	<1.0
6	Chemical Oxygen Demand	mg/l	39
7	Chlorides	mg/l	112
8	Sulphates	mg/l	143.2
9	Phosphates	mg/l	0.32
10	Zinc	mg/l	0.37
11	Chromium	mg/l	<0.01
12	Copper	mg/l	<0.01
13	Available Chlorine	mg/l	<0.2
14	Iron	mg/l	0.22
15	Oil and Grease	mg/l	<1.0

7.5 Water Depth measurement

Four ground water depths at villages and plant and four ash pond area locations were measured and results are given in **Table-18**.

TABLE-18
WATER DEPTH MEASUREMENT

Location Code	Location Name	Depth(m)
BW1	Banahil Village	2.03
OW1	Nariyara Village	2.26
OW2	Amora Village	1.87
OW3	Rogda Village	2.45
ASH1	Ash pond Location-1	4.87
ASH2	Ash pond Location-2	6.55
ASH3	Ash pond Location-3	6.20
ASH4	Ash pond Location-4	2.23

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7.6 Stack Emission Monitoring

The power plant has stack of height 275.0-m, which is the major source of air pollution. The stack emission monitoring for Unit-II, Unit-III and Unit - IV has been carried out and results are given in **Table-19 to Table-21**.

TABLE-19
STACK EMISSION MONITORING UNIT -II

Sr. No.	Parameters	UOM	Result	Methods
Date Of Sampling : 15/07/2024				
Sampling Time : 11.30 to 12.30 hrs				
Duration Of sampling : 60 mints				
Date of sample analysis : 18/07/2024				
Details of the source				
1	Capacity	MW	600	-
2	Stack Height	M	275	-
3	Duct Dimension	M	7.0	-
4	Duct area	m ²	38	-
Flue Gas Characteristics				
5	Temperature	°C	112	USEPA 1,2,3&4
6	Velocity	m/s	21.64	USEPA 1,2,3&4
7	Volumetric Flow Rate	Nm ³ /s	611.96	USEPA 1,2,3&4
8	Particulate Matter	mg/Nm ³	24.66	USEPA 5
9	Sulfur dioxide	mg/Nm ³	936	USEPA 6
10	Oxides of Nitrogen	mg/Nm ³	405	USEPA 7
11	Arsenic as As	mg/Nm ³	0.013	USEPA method -29
12	Cadmium as Cd	mg/Nm ³	0.015	USEPA method -29
13	Cobalt as Co	mg/Nm ³	<0.001	USEPA method -29
14	Nickel as Ni	mg/Nm ³	0.034	USEPA method -29
15	Copper as Cu	mg/Nm ³	0.040	USEPA method -29
16	Mercury as Hg	mg/Nm ³	0.014	USEPA method -29
17	Chromium as Cr	mg/Nm ³	0.032	USEPA method -29
18	Manganese as Mn	mg/Nm ³	0.041	USEPA method -29
19	Antimony as Sb	mg/Nm ³	<0.001	USEPA method -29
20	Lead as Pb	mg/Nm ³	0.038	USEPA method -29
21	Thallium as TI	mg/Nm ³	<0.001	USEPA method -29
22	Vanadium as V	mg/Nm ³	<0.001	USEPA method -29

The results indicate that the PM is observed as 24.66 mg/Nm³.


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TABLE-20
STACK EMISSION MONITORING UNIT -III

Sr. No.	Parameters	UOM	Result	Methods
Date Of Sampling : 16/07/2024				
Sampling Time : 11.00 to 12.00 hrs				
Duration Of sampling : 60 mints				
Date of sample analysis : 18/07/2024				
Details of the source				
1	Capacity	MW	600	-
2	Stack Height	M	275	-
3	Duct Dimension	M	7.0	-
4	Duct area	m ²	38	-
Flue Gas Characteristics				
5	Temperature	°C	115	USEPA 1,2,3&4
6	Velocity	m/s	21.00	USEPA 1,2,3&4
7	Volumetric Flow Rate	Nm ³ /s	589.02	USEPA 1,2,3&4
8	Particulate Matter	mg/Nm ³	8.08	USEPA 5
9	Sulfur dioxide	mg/Nm ³	998	USEPA 6
10	Oxides of Nitrogen	mg/Nm ³	395	USEPA 7
11	Arsenic as As	mg/Nm ³	0.028	USEPA method -29
12	Cadmium as Cd	mg/Nm ³	0.012	USEPA method -29
13	Cobalt as Co	mg/Nm ³	<0.001	USEPA method -29
14	Nickel as Ni	mg/Nm ³	0.027	USEPA method -29
15	Copper as Cu	mg/Nm ³	0.045	USEPA method -29
16	Mercury as Hg	mg/Nm ³	0.010	USEPA method -29
17	Chromium as Cr	mg/Nm ³	0.022	USEPA method -29
18	Manganese as Mn	mg/Nm ³	0.027	USEPA method -29
19	Antimony as Sb	mg/Nm ³	<0.001	USEPA method -29
20	Lead as Pb	mg/Nm ³	0.033	USEPA method -29
21	Thallium as TI	mg/Nm ³	<0.001	USEPA method -29
22	Vanadium as V	mg/Nm ³	<0.001	USEPA method -29

The results indicate that the PM is observed as 8.08 mg/Nm³.


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TABLE-21
STACK EMISSION MONITORING UNIT -IV

Sr. No.	Parameters	UOM	Result	Methods
Date Of Sampling : 16/07/2024				
Sampling Time : 15.00 to 16.00 hrs				
Duration Of sampling : 60 mints				
Date of sample analysis : 18/07/2024				
Details of the source				
1	Capacity	MW	600	-
2	Stack Height	M	275	-
3	Duct Dimension	M	7.0	-
4	Duct area	m ²	38	-
Flue Gas Characteristics				
5	Temperature	°C	113	USEPA 1,2,3&4
6	Velocity	m/s	22.67	USEPA 1,2,3&4
7	Volumetric Flow Rate	Nm ³ /s	632.72	USEPA 1,2,3&4
8	Particulate Matter	mg/Nm ³	12.84	USEPA 5
9	Sulfur dioxide	mg/Nm ³	944	USEPA 6
10	Oxides of Nitrogen	mg/Nm ³	342	USEPA 7
11	Arsenic as As	mg/Nm ³	0.018	USEPA method -29
12	Cadmium as Cd	mg/Nm ³	0.015	USEPA method -29
13	Cobalt as Co	mg/Nm ³	<0.001	USEPA method -29
14	Nickel as Ni	mg/Nm ³	0.028	USEPA method -29
15	Copper as Cu	mg/Nm ³	0.036	USEPA method -29
16	Mercury as Hg	mg/Nm ³	0.007	USEPA method -29
17	Chromium as Cr	mg/Nm ³	0.026	USEPA method -29
18	Manganese as Mn	mg/Nm ³	0.035	USEPA method -29
19	Antimony as Sb	mg/Nm ³	<0.001	USEPA method -29
20	Lead as Pb	mg/Nm ³	0.043	USEPA method -29
21	Thallium as TI	mg/Nm ³	<0.001	USEPA method -29
22	Vanadium as V	mg/Nm ³	<0.001	USEPA method -29

The results indicate that the PM is observed as 12.84 mg/Nm³.

ENVIRONMENTAL MONITORING REPORT
FOR
**6x600 MW COAL BASED POWER PLANT
OF KSK MAHANADI POWER COMPANY LTD
AT NARIYARA, JANJGIR-CHAMPA DISTRICT, CHHATTISGARH**

MONTHLY REPORT: AUGUST-2024


Client:

**KSK Mahanadi Power Company Ltd
Nariyara, Chhattisgarh**

Prepared by:



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	Monthly Environmental Monitoring Report for 6x600 MW Coal Based Power Plant of KSK Mahanadi Power Company Limited at Nariyara Village, Janjgir-Champa District, Chhattisgarh
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7.0 RESULTS OF SURVEY DATA

The monitoring results of Ambient Air Quality analysis for the month of **August-2024** are presented in below **Table-6 to Table-10**.

7.1 Ambient Air Quality Monitoring Results

TABLE-6
AAQ MONITORING RESULTS

Monitoring	PM2.5	PM10	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³
	Particulate				
BTG area – AAQ1					
09.08.2024	37.0	58.9	15.0	17.6	0.248
13.08.2024	42.5	60.4	12.8	15.9	0.255
21.08.2024	43.9	65.3	15.4	17.3	0.231
23.08.2024	40.8	57.7	14.1	15.6	0.279
28.08.2024	43.9	62.7	15.8	16.5	0.251
30.08.2024	41.5	59.6	13.7	15.6	0.243
Max	43.9	65.3	15.8	17.6	0.279
Min	37.0	57.7	12.8	15.6	0.231
Avg	41.8	60.8	14.5	16.4	0.251
98%ile	43.9	65.0	15.8	17.6	0.277
CHP area – AAQ2					
09.08.2024	41.6	73.8	16.5	18.6	0.262
13.08.2024	44.7	70.5	14.2	16.7	0.294
21.08.2024	42.9	72.9	15.1	17.3	0.278
23.08.2024	45.7	74.3	14.3	16.2	0.292
28.08.2024	48.6	69.3	15.6	18.4	0.311
30.08.2024	45.0	65.8	17.1	19.2	0.264
Max	48.6	74.3	17.1	19.2	0.311
Min	41.6	65.8	14.2	16.2	0.262
Avg	44.8	71.1	15.5	17.7	0.284
98%ile	48.3	74.3	17.0	19.1	0.309
DM plant area – AAQ3					
09.08.2024	41.0	56.6	14.2	16.2	0.227
13.08.2024	36.4	58.3	12.8	14.2	0.236
21.08.2024	41.6	62.4	13.3	15.6	0.221
23.08.2024	39.7	54.1	12.4	14.0	0.226
28.08.2024	36.6	63.5	14.6	16.2	0.243
30.08.2024	40.7	60.6	13.2	14.4	0.231
Max	41.6	63.5	14.6	16.2	0.243
Min	36.4	54.1	12.4	14.0	0.221
Avg	39.3	59.3	13.4	15.1	0.231
98%ile	41.5	63.4	14.6	16.2	0.242
Limits as per NAAQS	60	100	80	80	02
Test Methods	Gravimetric Method		Improved West & Geake Method	Modified Jacob & Hochheiser Method	NDIR spectroscopy method


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TABLE-7
AAQ MONITORING RESULTS

Monitoring Date	PM2.5	PM10	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³
	Particulate				
Ash handling area – AAQ4					
09.08.2024	46.2	72.4	15.2	17.5	0.287
13.08.2024	42.1	69.8	18.5	20.7	0.300
21.08.2024	45.1	71.9	14.9	16.4	0.336
23.08.2024	47.2	76.4	17.0	18.2	0.324
28.08.2024	49.7	72.5	16.0	19.0	0.294
30.08.2024	42.9	58.4	17.5	19.8	0.290
Max	49.7	76.4	18.5	20.7	0.336
Min	42.1	58.4	14.9	16.4	0.287
Avg	45.5	70.2	16.5	18.6	0.305
98%ile	49.5	76.0	18.4	20.6	0.335
Tarod Village – AAQ5					
09.08.2024	29.7	56.2	11.7	12.8	0.174
13.08.2024	27.7	58.6	12.1	14.1	0.152
21.08.2024	31.3	54.7	12.3	15.4	0.167
23.08.2024	28.4	57.1	11.1	13.4	0.148
28.08.2024	34.2	53.7	10.4	12.3	0.178
30.08.2024	29.6	55.9	13.1	13.6	0.159
Max	34.2	58.6	13.1	15.4	0.178
Min	27.7	53.7	10.4	12.3	0.148
Avg	30.2	56.0	11.8	13.6	0.163
98%ile	33.9	58.5	13.0	15.3	0.178
Jhalmala Village- AAQ6					
09.08.2024	34.8	52.3	9.9	12.4	0.154
13.08.2024	28.3	55.2	11.0	13.5	0.167
21.08.2024	33.5	50.8	8.7	12.2	0.141
23.08.2024	28.6	53.2	10.1	13.1	0.150
28.08.2024	29.7	49.6	9.5	12.8	0.172
30.08.2024	28.3	52.7	10.1	13.9	0.152
Max	34.8	55.2	11.0	13.9	0.172
Min	28.3	49.6	8.7	12.2	0.141
Avg	30.5	52.3	9.9	13.0	0.156
98%ile	34.7	55.0	10.9	13.9	0.172
Amora Village - AAQ7					
09.08.2024	34.2	56.0	11.6	14.1	0.145
13.08.2024	29.8	55.6	10.5	12.3	0.133
21.08.2024	34.0	59.2	12.5	15.3	0.135
23.08.2024	26.0	54.3	9.9	12.6	0.136
28.08.2024	31.9	60.3	11.2	14.6	0.158
30.08.2024	30.5	54.9	10.4	12.9	0.145
Max	34.2	60.3	12.5	15.3	0.158
Min	26.0	54.3	9.9	12.3	0.133
Avg	31.1	56.9	11.0	13.6	0.142
98%ile	34.2	60.2	12.4	15.2	0.157
Limits as per NAAQS	60	100	80	80	02



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TABLE-8
AAQ MONITORING RESULTS

Monitoring Date	PM2.5	PM10	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³
	Particulate				
Sonsari Village - AAQ8					
09.08.2024	30.5	56.3	13.0	14.5	0.150
13.08.2024	27.3	53.0	10.1	12.1	0.125
21.08.2024	31.6	58.4	11.2	14.2	0.135
23.08.2024	29.2	55.1	10.2	12.0	0.167
28.08.2024	28.7	57.6	12.0	14.2	0.141
30.08.2024	32.6	55.7	10.4	13.2	0.133
Max	32.6	58.4	13.0	14.5	0.167
Min	27.3	53.0	10.1	12.0	0.125
Avg	30.0	56.0	11.2	13.4	0.142
98%ile	32.5	58.3	12.9	14.5	0.165
Nariyara Village – AAQ9					
09.08.2024	28.7	53.5	10.6	13.0	0.133
13.08.2024	26.9	55.2	11.8	14.1	0.139
21.08.2024	27.4	50.1	12.2	13.2	0.157
23.08.2024	29.8	54.7	9.7	14.3	0.134
28.08.2024	32.7	52.9	10.8	13.3	0.161
30.08.2024	29.4	54.1	11.6	14.7	0.130
Max	32.7	55.2	12.2	14.7	0.161
Min	26.9	50.1	9.7	13.0	0.130
Avg	29.2	53.4	11.1	13.8	0.142
98%ile	32.4	55.2	12.2	14.7	0.161
Limits as per NAAQS	60	100	80	80	02

Teflon filter paper was used in PM2.5 & whatman filter paper for PM10 weighed in Mettler electronic balance and computed as per standard methods PM2.5, PM10, SO₂, NO_x is monitored on 24 hrs. Basis CO is monitored on 8 hours basis All the values are expressed in µg/m³ except CO is measured in mg/m³

	Monthly Environmental Monitoring Report for 6x600 MW Coal Based Power Plant of KSK Mahanadi Power Company Limited at Nariyara Village, Janjgir-Champa District, Chhattisgarh
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**TABLE-9
AAQ MONITORING RESULTS**

Monitoring Date & Location	Arsenic ng/m ³	Nickel ng/m ³	Lead µg/m ³	O ₃ µg/m ³	NH ₃ µg/m ³	C ₆ H ₆ µg/m ³	Benzo(a) Pyrene ng/m ³	Hg µg/m ³
BTG area – AAQ1								
09.08.2024	<1.0	1.2	0.004	10.1	<20	<1.0	<0.1	<0.001
13.08.2024	<1.0	2.0	<0.001	11.2	<20	<1.0	<0.1	<0.001
21.08.2024	<1.0	<1.0	0.001	9.0	<20	<1.0	<0.1	<0.001
23.08.2024	<1.0	1.6	0.002	8.8	<20	<1.0	<0.1	<0.001
28.08.2024	<1.0	2.1	0.003	11.2	<20	<1.0	<0.1	<0.001
30.08.2024	<1.0	1.8	<0.001	9.3	<20	<1.0	<0.1	<0.001
Max	<1.0	2.1	0.004	11.2	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	8.8	<20	<1.0	<0.1	<0.001
Avg	<1.0	1.7	0.003	9.9	<20	<1.0	<0.1	<0.001
98%	<1.0	2.1	0.004	11.2	<20	<1.0	<0.1	<0.001
CHP area – AAQ2								
09.08.2024	<1.0	1.9	0.005	11.3	<20	<1.0	<0.1	<0.001
13.08.2024	<1.0	1.7	0.002	13.2	<20	<1.0	<0.1	<0.001
21.08.2024	<1.0	3.0	0.001	10.4	<20	<1.0	<0.1	<0.001
23.08.2024	<1.0	2.1	<0.001	14.4	<20	<1.0	<0.1	<0.001
28.08.2024	<1.0	1.7	0.003	13.6	<20	<1.0	<0.1	<0.001
30.08.2024	<1.0	1.3	0.005	9.9	<20	<1.0	<0.1	<0.001
Max	<1.0	3.0	0.005	14.4	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	9.9	<20	<1.0	<0.1	<0.001
Avg	<1.0	2.0	0.003	12.1	<20	<1.0	<0.1	<0.001
98%	<1.0	2.9	0.005	14.3	<20	<1.0	<0.1	<0.001
DM plant area – AAQ3								
09.08.2024	<1.0	<1.0	<0.001	9.1	<20	<1.0	<0.1	<0.001
13.08.2024	<1.0	1.2	0.002	10.2	<20	<1.0	<0.1	<0.001
21.08.2024	<1.0	<1.0	0.003	9.5	<20	<1.0	<0.1	<0.001
23.08.2024	<1.0	1.4	<0.001	10.7	<20	<1.0	<0.1	<0.001
28.08.2024	<1.0	1.6	0.002	9.3	<20	<1.0	<0.1	<0.001
30.08.2024	<1.0	1.3	0.004	8.9	<20	<1.0	<0.1	<0.001
Max	<1.0	1.6	0.004	10.7	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	8.3	<20	<1.0	<0.1	<0.001
Avg	<1.0	1.4	0.003	9.5	<20	<1.0	<0.1	<0.001
98%	<1.0	1.6	0.004	10.7	<20	<1.0	<0.1	<0.001
Ash handling area – AAQ4								
09.08.2024	<1.0	1.7	0.004	12.0	<20	<1.0	<0.1	<0.001
13.08.2024	<1.0	<1.0	0.001	9.8	<20	<1.0	<0.1	<0.001
21.08.2024	<1.0	2.7	0.002	10.9	<20	<1.0	<0.1	<0.001
23.08.2024	<1.0	2.0	0.004	13.9	<20	<1.0	<0.1	<0.001
28.08.2024	<1.0	2.8	<0.001	14.7	<20	<1.0	<0.1	<0.001
30.08.2024	<1.0	<1.0	0.006	12.7	<20	<1.0	<0.1	<0.001
Max	<1.0	2.8	0.006	14.7	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	0.001	9.8	<20	<1.0	<0.1	<0.001
Avg	<1.0	2.3	0.003	12.3	<20	<1.0	<0.1	<0.001
98%	<1.0	2.8	0.006	14.6	<20	<1.0	<0.1	<0.001
Limits as	06	20	1.0	100	400	05	01	-


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TABLE-10
AAQ MONITORING RESULTS

Monitoring Date & Location	Arsenic ng/m ³	Nickel ng/m ³	Lead µg/m ³	O ₃ µg/m ³	NH ₃ µg/m ³	C ₆ H ₆ µg/m ³	Benzo(a) Pyrene ng/m ³	Hg µg/m ³
Tarod Village – AAQ5								
09.08.2024	<1.0	<1.0	<0.001	5.7	<20	<1.0	<0.1	<0.001
13.08.2024	<1.0	<1.0	<0.001	6.4	<20	<1.0	<0.1	<0.001
21.08.2024	<1.0	<1.0	<0.001	6.9	<20	<1.0	<0.1	<0.001
23.08.2024	<1.0	<1.0	<0.001	8.4	<20	<1.0	<0.1	<0.001
28.08.2024	<1.0	<1.0	<0.001	7.7	<20	<1.0	<0.1	<0.001
30.08.2024	<1.0	<1.0	<0.001	5.7	<20	<1.0	<0.1	<0.001
Max	<1.0	<1.0	<0.001	8.4	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	5.7	<20	<1.0	<0.1	<0.001
Avg	<1.0	<1.0	<0.001	6.8	<20	<1.0	<0.1	<0.001
98%	<1.0	<1.0	<0.001	8.3	<20	<1.0	<0.1	<0.001
Jhalmala Village- AAQ-6								
09.08.2024	<1.0	<1.0	<0.001	6.1	<20	<1.0	<0.1	<0.001
13.08.2024	<1.0	<1.0	<0.001	4.8	<20	<1.0	<0.1	<0.001
21.08.2024	<1.0	<1.0	<0.001	6.1	<20	<1.0	<0.1	<0.001
23.08.2024	<1.0	<1.0	<0.001	7.1	<20	<1.0	<0.1	<0.001
28.08.2024	<1.0	<1.0	<0.001	5.7	<20	<1.0	<0.1	<0.001
30.08.2024	<1.0	<1.0	<0.001	6.4	<20	<1.0	<0.1	<0.001
Max	<1.0	<1.0	<0.001	7.1	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	4.8	<20	<1.0	<0.1	<0.001
Avg	<1.0	<1.0	<0.001	6.0	<20	<1.0	<0.1	<0.001
98%	<1.0	<1.0	<0.001	7.0	<20	<1.0	<0.1	<0.001
Amora Village – AAQ7								
09.08.2024	<1.0	<1.0	<0.001	6.4	<20	<1.0	<0.1	<0.001
13.08.2024	<1.0	<1.0	<0.001	7.2	<20	<1.0	<0.1	<0.001
21.08.2024	<1.0	<1.0	<0.001	5.1	<20	<1.0	<0.1	<0.001
23.08.2024	<1.0	<1.0	<0.001	7.0	<20	<1.0	<0.1	<0.001
28.08.2024	<1.0	<1.0	<0.001	8.2	<20	<1.0	<0.1	<0.001
30.08.2024	<1.0	<1.0	<0.001	7.2	<20	<1.0	<0.1	<0.001
Max	<1.0	<1.0	<0.001	8.2	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	5.1	<20	<1.0	<0.1	<0.001
Avg	<1.0	<1.0	<0.001	6.9	<20	<1.0	<0.1	<0.001
98%	<1.0	<1.0	<0.001	8.1	<20	<1.0	<0.1	<0.001
Limits as	06	20	1.0	100	400	05	01	-

Below Detectable Limit for as and Ni 1.0 ng/m³ Below Detectable Limit for Pb 0.001 µg/m³ Ozone and CO is monitored on 8 hours basis Below Detectable Limit for O₃ 50 µg/m³ Below Detectable Limit for NH₃ 20 µg/m³



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TABLE-11
AAO MONITORING RESULTS

Monitoring Date & Location	Arsenic ng/m ³	Nickel ng/m ³	Lead µg/m ³	O ₃ µg/m ³	NH ₃ µg/m ³	C ₆ H ₆ µg/m ³	Benzo(a) Pyrene ng/m ³	Hg µg/m ³
Sonsari Village – AAQ8								
09.08.2024	<1.0	<1.0	<0.001	5.6	<20	<1.0	<0.1	<0.001
13.08.2024	<1.0	<1.0	<0.001	6.1	<20	<1.0	<0.1	<0.001
21.08.2024	<1.0	<1.0	<0.001	7.2	<20	<1.0	<0.1	<0.001
23.08.2024	<1.0	<1.0	<0.001	6.4	<20	<1.0	<0.1	<0.001
28.08.2024	<1.0	<1.0	<0.001	5.8	<20	<1.0	<0.1	<0.001
30.08.2024	<1.0	<1.0	<0.001	4.7	<20	<1.0	<0.1	<0.001
Max	<1.0	<1.0	<0.001	7.2	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	4.7	<20	<1.0	<0.1	<0.001
Avg	<1.0	<1.0	<0.001	6.0	<20	<1.0	<0.1	<0.001
98%	<1.0	<1.0	<0.001	7.1	<20	<1.0	<0.1	<0.001
Nariyara Village – AAQ9								
09.08.2024	<1.0	<1.0	<0.001	7.5	<20	<1.0	<0.1	<0.001
13.08.2024	<1.0	<1.0	<0.001	6.5	<20	<1.0	<0.1	<0.001
21.08.2024	<1.0	<1.0	<0.001	7.2	<20	<1.0	<0.1	<0.001
23.08.2024	<1.0	<1.0	<0.001	5.9	<20	<1.0	<0.1	<0.001
28.08.2024	<1.0	<1.0	<0.001	6.7	<20	<1.0	<0.1	<0.001
30.08.2024	<1.0	<1.0	<0.001	5.5	<20	<1.0	<0.1	<0.001
Max	<1.0	<1.0	<0.001	7.5	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	5.5	<20	<1.0	<0.1	<0.001
Avg	<1.0	<1.0	<0.001	6.6	<20	<1.0	<0.1	<0.001
98%	<1.0	<1.0	<0.001	7.5	<20	<1.0	<0.1	<0.001
Limits as	06	20	1.0	100	400	05	01	-

Below Detectable Limit for As and Ni 1.0 ng/m³ Below Detectable Limit for Pb 0.001 µg/m³ Ozone and CO is monitored on 8 hours basis Below Detectable Limit for O₃ 50 µg/m³ Below Detectable Limit for NH₃ 20 µg/m³

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7.1.1 Observations (Inside the premises)

PM2.5: The maximum value for PM2.5 observed at AHP area as 49.7 $\mu\text{g}/\text{m}^3$ and minimum value for PM2.5 at DM plant area as 36.4 $\mu\text{g}/\text{m}^3$. The 24 hours applicable limit inside the plant premises 60 $\mu\text{g}/\text{m}^3$ for industrial area.

PM10: The maximum value for PM10 observed at AHP area as 76.4 $\mu\text{g}/\text{m}^3$ and minimum value for PM10 at DM Plant area as 54.1 $\mu\text{g}/\text{m}^3$. The 24 hours applicable limit inside the plant premises 100 $\mu\text{g}/\text{m}^3$ for industrial area.

SO₂: The maximum value for SO₂ observed at AHP plant area as 18.5 $\mu\text{g}/\text{m}^3$ and minimum value for SO₂ at DM Plant area as 12.4 $\mu\text{g}/\text{m}^3$. The 24 hours applicable limit inside the plant premises 80 $\mu\text{g}/\text{m}^3$ for industrial area.

NO₂: The maximum value for NO₂ observed at AHP area as 20.7 $\mu\text{g}/\text{m}^3$ and minimum value for NO₂ at DM Plant area as 14.0 $\mu\text{g}/\text{m}^3$. The 24 hours applicable limit inside the plant premises 80 $\mu\text{g}/\text{m}^3$ for industrial area.

CO: The maximum value for CO observed at AHP area as 0.336 mg/m^3 and minimum value for CO at DM plant as 0.221 mg/m^3 . The 8 hours applicable limit inside the plant premises 02 mg/m^3 for industrial area.

Ammonia: The maximum and minimum value for Ammonia observed at all the locations as <20 $\mu\text{g}/\text{m}^3$. The 24 hours' applicable limit inside the plant premises 400 $\mu\text{g}/\text{m}^3$ for industrial area

Nickel: The maximum value for Nickel observed at CHP area as 3.0 ng/m^3 and <1.0 ng/m^3 minimum value for BTG, DM, CHP & AHP Plant area. The 24 hours' applicable limit inside the plant premises 20 ng/m^3 for industrial area.


Arsenic: The maximum and minimum value for Arsenic observed at all the locations as <1.0 ng/m^3 . The 24 hours applicable limit inside the plant premises 6 ng/m^3 for industrial area

Lead: The maximum value for Lead observed at AHP area as 0.006 $\mu\text{g}/\text{m}^3$ and minimum value for BTG, DM, CHP & AHP Plant area as <0.001 $\mu\text{g}/\text{m}^3$. The 24 hours' applicable limit inside the plant premises 1 $\mu\text{g}/\text{m}^3$ for industrial area.

Ozone: The maximum value for Ozone observed at AHP area as 14.7 $\mu\text{g}/\text{m}^3$ and minimum value for Ozone DM Plant Plant area as 8.3 $\mu\text{g}/\text{m}^3$. The 8 hours' applicable limit inside the plant premises 100 $\mu\text{g}/\text{m}^3$ for industrial area.

Benzo(a)Pyrene: The maximum and minimum value for Benzo(a)Pyrene observed at all the locations as <0.1 ng/m^3 . The 24 hours applicable limit inside the plant premises 1 ng/m^3 for industrial area

Benzene: The maximum and minimum value for Benzene observed at all the locations as <1.0 $\mu\text{g}/\text{m}^3$. The 24 hours applicable limit inside the plant premises 5 $\mu\text{g}/\text{m}^3$ for industrial area

	<p>Monthly Environmental Monitoring Report for 6x600 MW Coal Based Power Plant of KSK Mahanadi Power Company Limited at Nariyara Village, Janjgir-Champa District, Chhattisgarh</p> <p style="text-align: right;">August 2024</p>
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Mercury: The maximum and minimum value for Mercury observed at all the locations as $<0.001 \mu\text{g g} / \text{m}^3$ for 24 hours.

7.1.2 Observations (Outside the premises)

PM_{2.5}: The maximum value for PM_{2.5} observed at Jhalmala village as $34.8 \mu\text{g} / \text{m}^3$ and minimum value for PM_{2.5} at Amora village as $26.0 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $60 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

PM₁₀: The maximum value for PM₁₀ observed at Tarod village as $56.8 \mu\text{g} / \text{m}^3$ and minimum value for PM₁₀ at Jhalmala village as $49.6 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $100 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

SO₂: The maximum value for SO₂ observed at Tarod village as $13.1 \mu\text{g} / \text{m}^3$ and minimum value for SO₂ at Jhalmala village as $8.7 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the Plant premises $80 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

NO_x: The maximum value for NO_x observed at Tarod village as $15.4 \mu\text{g} / \text{m}^3$ and minimum value for NO_x at Sonsari village as $12.0 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $80 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

CO: The maximum value for CO observed at Tarod village as $0.178 \text{ mg} / \text{m}^3$ and minimum value for CO at Sonsari village as $0.125 \text{ mg} / \text{m}^3$. The 8 hours' applicable limit outside the plant premises $02 \text{ mg} / \text{m}^3$ for Rural/Residential area.

Ammonia: The maximum and minimum value for Ammonia observed at all the locations as $<20 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $400 \mu\text{g} / \text{m}^3$ for Rural/Residential area.


Nickel: The maximum and minimum value for Nickel observed at all the locations as $<1.0 \text{ ng} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $20 \text{ ng} / \text{m}^3$ for Rural/Residential area.

Arsenic: The maximum and minimum value for Arsenic observed at all the locations as $<1.0 \text{ ng} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $6 \text{ ng} / \text{m}^3$ for Rural/Residential area

Lead: The maximum and minimum value for Lead observed at all the locations as $<0.001 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $1 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

Ozone: The maximum value for Ozone observed at Nariyara village as $8.4 \mu\text{g} / \text{m}^3$ and minimum value for Ozone at Sonsari village as $4.7 \mu\text{g} / \text{m}^3$. The 8 hours applicable limit outside the plant premises $100 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

Benzo(a)Pyrene: The maximum and minimum value for Benzo(a)Pyrene observed at all the locations as $<0.1 \text{ ng} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $1 \text{ ng} / \text{m}^3$ for Rural/Residential area

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Benzene: The maximum and minimum value for Benzene observed at all the locations as $<1.0 \mu\text{g}/\text{m}^3$. The 24 hours applicable limit outside the plant premises $5 \mu\text{g}/\text{m}^3$ for Rural/Residential area

Mercury: The maximum and minimum value for Mercury observed at all the locations as $<0.001 \mu\text{g}/\text{m}^3$ for 24 hours.

7.1.2 Results and conclusions:

The results of the monitored data indicate that the ambient air quality of the region in general is conformity with respect to norms of National Ambient Air Quality standards of CPCB, at all locations monitored.

7.2 Noise Monitoring

7.2.1 Source Noise Monitoring – Inside the Plant Premises


The spot noise levels observed inside the premises at various locations is given in **Table-12**

TABLE-12
INDUSTRIAL NOISE LEVELS IN WORK ENVIRONMENT

Sr. No	Code	Location	Date of sampling	Noise Level L_{eq} [dB(A)]
1	N1	TG floor	01/08/2024	71.4
2	N2	Cooling tower#3	01/08/2024	68.5
3	N3	Main Gate	01/08/2024	65.3
4	N4	Boiler feed pump	10/08/2024	82.5
5	N5	Admin Building area	01/08/2024	53.4
6	N6	CHP Machine area	10/08/2024	74.3
7	N7	AHP area	01/08/2024	71.6
8	N8	Ash Silo area	10/08/2024	69.3
9	N9	CW Pump house	10/08/2024	80.4
10	N10	Compressor 1	05/08/2024	83.2
11	N11	Compressor 2	05/08/2024	82.9
12	N12	Compressor 3	05/08/2024	83.6
13	N13	Compressor 4	05/08/2024	82.5

7.2.1.1 Observations

The industrial noise levels within the premises at Work Zone area are observed to be in the range of 53.4 to 83.6 dB (A), which are within the prescribed limit of 85 dB (A).

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7.2.3 Noise Monitoring – Outside the Premises

The statistical analysis is done for measured noise levels at four locations in the study area. The parameters are analyzed for L_{day} , L_{night} , and L_{dn} . The statistical analysis results are given in **Table-13**.

TABLE-13
AMBIENT NOISE LEVELS IN THE STUDY AREA

All the values are given in dB (A)

Code	Location	Date of sampling	L ₁₀	L ₅₀	L ₉₀	Leq	L _{day}	L _{night}	L _{dn}
N14	Banahill Village	02.08.2024	52.6	48.7	45.0	49.7	50.5	42.5	47.9
N15	Tarod Village	27.08.2024	51.3	47.4	43.7	48.4	49.2	41.8	46.7
N16	Rogda Village	23.08.2024	54.4	50.5	46.8	51.5	52.3	43.2	50.0
N17	Jhalmala Village	06.08.2024	50.9	47.0	43.3	48.0	48.7	42.6	46.5
N18	Nariyara Village	03.08.2024	52.5	48.6	44.9	49.6	50.4	41.7	48.3
N19	Sonsari Village	13.08.2024	51.6	47.7	44.0	48.7	49.5	42.0	47.2
N20	Amora Village	20.08.2024	54.0	50.1	46.4	51.1	51.9	43.5	49.1
N21	Arasmeta Village	16.08.2024	52.8	48.9	45.2	49.9	50.7	41.9	47.8

7.2.3.1 Observations

d) Day time Noise Levels (L_{day})

Residential Area

The daytime (L_{day}) noise levels are observed to be in the range of 52.3 dB (A) – 48.7 dB (A), which are within the prescribed limit of 55 dB (A).

e) Night time Noise Levels (L_{night})

Residential Area

The nighttime (L_{night}) noise levels were observed to be in the range of 43.5 dB (A) – 41.7 dB (A), which are within the prescribed limit of 45 dB (A).

7.3 Ground Water Quality

Four ground water samples were collected around Ash pond area and four ground water samples were collected at villages around the plant site and analyzed for various parameters. The analytical results are presented below in **Table-14** and **Table-15**.


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TABLE-14
GROUND WATER QUALITY AROUND ASHPOND

Sr. No	Parameter	Units	GW1	GW2	GW3	GW4	
	Sampling season		Monsoon Season				
	Sampling date		10.08.2024	10.08.2024	10.08.2024	10.08.2024	
	Date of analysis		12.08.2024	12.08.2024	12.08.2024	12.08.2024	
1	pH	--	7.25	6.97	7.16	7.07	6.5 – 8.5 (NR)
2	Color	Hazen	5	9	10	12	5(15)
3	Taste	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Odour	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Conductivity	µs/cm	981	1105	873	1492	\$
6	Turbidity	NTU	5	3	4	5	1(5)
7	Total Dissolved Solids	mg/l	637	729	558	984	500(2000)
8	Total Hardness as CaCO ₃	mg/l	290	341	253	457	200(600)
9	Total Alkalinity as CaCO ₃	mg/l	192	218	174	327	200(600)
10	Calcium as Ca ²⁺	mg/l	63.2	69.4	57.6	98.4	75(200)
11	Magnesium as Mg ²⁺	mg/l	32.1	40.7	26.5	51.3	30(100)
12	Residual Chlorine	mg/l	<0.2	<0.2	<0.2	<0.2	0.2(1)
13	Boron as B	mg/l	0.3	0.2	0.4	0.8	0.5(1)
14	Chloride as Cl ⁻	mg/l	156.7	171.9	135.2	198.4	250(1000)
15	Sulphate as SO ₄ ²⁺	mg/l	62.5	73.8	61.2	118.2	200(400)
16	Fluorides as F	mg/l	0.7	1.2	0.5	1.1	1.0(1.5)
17	Nitrate as NO ₃	mg/l	12.4	14.2	7.8	15.3	45(NR)
18	Sodium as Na ⁺	mg/l	84.3	86.2	78.5	120.3	\$
19	Potassium as K ⁺	mg/l	13.4	14.5	10.1	21.5	\$
20	Phenolic Compounds	mg/l	<0.001	<0.001	<0.001	<0.001	0.001(0.002)
21	Cyanides as CN	mg/l	<0.02	<0.02	<0.02	<0.02	0.05 (NR)
22	Anionic Detergents	mg/l	<0.1	<0.1	<0.1	<0.1	0.2 (1.0)
23	Mineral Oil	mg/l	<0.01	<0.01	<0.01	<0.01	0.5 (NR)
24	Cadmium as Cd	mg/l	<0.001	<0.001	<0.001	<0.001	0.003 (NR)
25	Total Arsenic as As	mg/l	<0.01	<0.01	<0.01	<0.01	0.01 (0.05)
26	Copper as Cu	mg/l	<0.01	<0.01	<0.01	<0.01	0.05 (1.5)
27	Lead as Pb	mg/l	<0.01	<0.01	<0.01	<0.01	0.01 (NR)
28	Manganese as Mn	mg/l	<0.01	<0.01	<0.01	<0.01	0.1 (0.3)
29	Iron as Fe	mg/l	0.06	0.09	0.05	0.08	0.3(NR)
30	Total Chromium (as Cr)	mg/l	<0.05	<0.05	<0.05	<0.05	0.05(NR)
31	Selenium as Se	mg/l	<0.01	<0.01	<0.01	<0.01	0.01(NR)
32	Zinc as Zn	mg/l	0.27	0.18	0.20	0.29	5(15)
33	Aluminium as Al	mg/l	<0.01	<0.01	<0.01	<0.01	0.03(0.2)
34	Mercury as Hg	mg/l	<0.001	<0.001	<0.001	<0.001	0.001(NR)
35	Pesticides	mg/l	Absent	Absent	Absent	Absent	Absent
36	E. Coli	--	Absent	Absent	Absent	Absent	Absent
37	Total Coliforms	MPN/100ml	Absent	Absent	Absent	Absent	10

Note: \$ - Limits not specified; NR - No Relaxation Limits are shown in IS 10500 are Acceptable limits (Requirement) and in parenthesis are Permissible limit in absence of alternate source

Sampling Locations

GW1. Ash pond Location-1, GW2. Ash pond Location-2, GW3. Ash pond Location-3, GW4. Ash pond Location-4

7.3.1 Observations

7.3.2.1 Ground Water Quality

The analysis results indicate that the pH and conductivity of the ground water was found to be in the range of 6.97– 7.25 and 873 to 1492 µS/cm. The Total Dissolved Solids were found to be well within the limits ranging from 558 to 984 mg/L Other parameters like Chlorides, Sulphates, Nitrates and Fluorides were observed to be well within the prescribed limits. The overall physico-chemical analysis of all the parameters is well within the standards as per IS: 10500.


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TABLE-15
GROUND WATER QUALITY IN STUDY AREA

Sr. No	Parameter	Units	GW1	GW2	GW3	GW4	Limits as per IS:10500
	Sampling season		Monsoon Season				
	Sampling date		09.08.2024	09.08.2024	09.08.2024	09.08.2024	
	Date of analysis		12.08.2024	12.08.2024	12.08.2024	12.08.2024	
1	pH	--	7.51	7.65	7.61	7.70	6.5 – 8.5 (NR)
2	Color	Hazen	<1.0	<1.0	<1.0	<1.0	5(15)
3	Taste	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Odour	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Conductivity	µs/cm	469	598	678	626	\$
6	Turbidity	NTU	<1.0	<1.0	<1.0	<1.0	1(5)
7	Total Dissolved Solids	mg/l	295	382	440	405	500(2000)
8	Total Hardness as CaCO ₃	mg/l	126	179	209	172	200(600)
9	Total Alkalinity as CaCO ₃	mg/l	95	133	145	156	200(600)
10	Calcium as Ca ²⁺	mg/l	28.4	31.8	38.2	32.6	75(200)
11	Magnesium as Mg ²⁺	mg/l	13.4	24.2	27.5	22.1	30(100)
12	Residual Chlorine	mg/l	<0.2	<0.2	<0.2	<0.2	0.2(1)
13	Boron as B	mg/l	0.04	0.06	0.03	0.05	0.5(1)
14	Chloride as Cl ⁻	mg/l	72.6	83.3	98.2	78.3	250(1000)
15	Sulphate as SO ₄ ²⁺	mg/l	29.4	38.2	44.1	34.6	200(400)
16	Fluorides as F	mg/l	0.3	0.6	0.5	0.4	1.0(1.5)
17	Nitrate as NO ₃	mg/l	6.2	8.1	9.8	10.4	45(NR)
18	Sodium as Na ⁺	mg/l	46.2	50.3	53.7	57.4	\$
19	Potassium as K ⁺	mg/l	6.4	8.4	10.8	12.3	\$
20	Phenolic Compounds	mg/l	<0.001	<0.001	<0.001	<0.001	0.001(0.002)
21	Cyanides as CN	mg/l	<0.02	<0.02	<0.02	<0.02	0.05 (NR)
22	Anionic Detergents	mg/l	<0.1	<0.1	<0.1	<0.1	0.2 (1.0)
23	Mineral Oil	mg/l	<0.01	<0.01	<0.01	<0.01	0.5 (NR)
24	Cadmium as Cd	mg/l	<0.001	<0.001	<0.001	<0.001	0.003 (NR)
25	Total Arsenic as As	mg/l	<0.01	<0.01	<0.01	<0.01	0.01 (0.05)
26	Copper as Cu	mg/l	<0.01	<0.01	<0.01	<0.01	0.05 (1.5)
27	Lead as Pb	mg/l	<0.01	<0.01	<0.01	<0.01	0.01 (NR)
28	Manganese as Mn	mg/l	<0.01	<0.01	<0.01	<0.01	0.1 (0.3)
29	Iron as Fe	mg/l	0.03	0.05	0.03	0.02	0.3(NR)
30	Total Chromium (as Cr)	mg/l	<0.05	<0.05	<0.05	<0.05	0.05(NR)
31	Selenium as Se	mg/l	<0.01	<0.01	<0.01	<0.01	0.01(NR)
32	Zinc as Zn	mg/l	0.20	0.17	0.19	0.14	5(15)
33	Aluminium as Al	mg/l	<0.01	<0.01	<0.01	<0.01	0.03(0.2)
34	Mercury as Hg	mg/l	<0.001	<0.001	<0.001	<0.001	0.001(NR)
35	Pesticides	mg/l	Absent	Absent	Absent	Absent	Absent
36	E. Coli	--	Absent	Absent	Absent	Absent	Absent
37	Total Coliforms	MPN/100ml	Absent	Absent	Absent	Absent	10

Note: \$ - Limits not specified; NR - No Relaxation Limits are shown in IS 10500 are Acceptable limits (Requirement) and in parenthesis are Permissible limit in absence of alternate source


Sampling Locations

GW1. Amora Village (Bore well) , GW2. Rogda (Bore well)
GW3. Banahill (Bore well) , GW4. Nariyara Village (Bore well)

7.3.1 Observations

7.3.2.1 Ground Water Quality

The analysis results indicate that the pH and conductivity of the ground water was found to be in the range of 7.51 - 7.70 and 469 to 678 µS/cm. The Total Dissolved Solids were found to be well within the limits ranging from 295 to 985 mg/L. Other parameters like Chlorides, Sulphates, Nitrates and Fluorides were observed to be well within the prescribed limits. The overall physico-chemical analysis of all the parameters is well within the standards as per IS: 10500.

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7.4 Waste Water Quality

Four waste water samples were collected within the plant site and analyzed for various parameters. The analytical results are presented below in **Table-16**.

TABLE-16
WASTE WATER QUALITY


Sr. No.	Parameters	Units	CT Blow Down	Boiler Blow Down	Condenser Cooling water	Guard Pond	Limits as per CECB& CPCB
			WW1	WW2	WW3	WW4	
	Sampling Date		10.08.2024	10.08.2024	10.08.2024	10.08.2024	
	Date of Analysis		12.08.2024	12.08.2024	12.08.2024	12.08.2024	
1	p ^H	-	7.66	8.23	8.06	7.52	6.5-8.5
	Temperature	°C	27.8	28.6	29.2	27.5	
3	Total Dissolved Solids	mg/l	476	13	5	960	-
4	Total Suspended Solids	mg/l	19.5	<1.0	<1.0	65.3	100
5	Dissolved Oxygen	mg/l	5.1	5.4	5.3	5.0	-
6	Biochemical Oxygen Demand, (3 days at 27°C)	mg/l	<3	<3	<3	<3	-
7	Chemical Oxygen Demand	mg/l	<5	<5	<5	54	-
8	Chlorides	mg/l	62.3	19.4	15.5	127.4	-
9	Sulphates	mg/l	52.4	29.3	24.5	105.3	-
10	Phosphates	mg/l	0.32	<0.01	<0.01	1.04	5.0
11	Zinc	mg/l	<0.01	<0.01	<0.01	0.2	1.0
12	Chromium	mg/l	<0.01	<0.01	<0.01	<0.01	0.2
13	Copper	mg/l	<0.01	<0.01	<0.01	<0.01	1.0
14	Free Available chlorine	mg/l	<0.2	<0.2	<0.2	<0.2	0.5
15	Irons	mg/l	<0.01	<0.01	<0.01	0.10	1.0
16	Oil & Grease	mg/l	<1.0	<1.0	<1.0	<1.0	20

7.4.1 Results and Conclusions

The data analysis to be as per CFO Norms and analytical results indicated that the guard pond waste water is well within the standard limits specified by EPA Notification [G.S.R.7, dt. Dec.22,1998].

7.4.2 Observations-Waste water quality.

The analysis results indicate that the pH ranges from 7.52 – 8.23 and the Total Suspended Solids were found to be within the limits ranging from <1.0-65.3 mg/l. Other parameters like Zinc, Chromium, Available, chloride, Iron and Oil& Grease were observed to be well within the prescribed limits.

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7.4.3 Sewage Waste Water Quality

One Sewage water samples is collected and analyzed for various parameters. The survey analytical results are given in **Table-17**.

TABLE-17
SEWAGE WASTE WATER QUALITY


Sr.No	Parameter	UOM	WW5 (STP Outlet)
	Sampling Date		10.08.2024
	Date of Analysis		12.08.2024
1	pH	-	7.61
2	Total Dissolved Solids	mg/l	401
3	Total Suspended Solids	mg/l	27.6
4	Dissolved Oxygen	mg/l	5.3
5	Bio Chemical Oxygen Demand for 3 day 27°C	mg/l	<1.0
6	Chemical Oxygen Demand	mg/l	33
7	Chlorides	mg/l	87.3
8	Sulphates	mg/l	126.8
9	Phosphates	mg/l	0.25
10	Zinc	mg/l	0.32
11	Chromium	mg/l	<0.01
12	Copper	mg/l	<0.01
13	Available Chlorine	mg/l	<0.2
14	Iron	mg/l	0.17
15	Oil and Grease	mg/l	<1.0

7.5 Water Depth measurement

Four ground water depths at villages and plant and four ash pond area locations were measured and results are given in **Table-18**.

TABLE-18
WATER DEPTH MEASUREMENT

Location Code	Location Name	Depth(m)
BW1	Banahil Village	1.87
OW1	Nariyara Village	1.54
OW2	Amora Village	1.66
OW3	Rogda Village	2.07
ASH1	Ash pond Location-1	4.25
ASH2	Ash pond Location-2	4.88
ASH3	Ash pond Location-3	5.46
ASH4	Ash pond Location-4	1.56

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7.6 Soil Quality

Soil Samples were collected from eight locations around the plant site area. The soil quality results are given below in **Table-19** and **Table-20**.

TABLE-19
SOIL QUALITY RESULTS

Sr. No	Parameters	Unit	S1	S2	S3	S4
	Sampling Date		27/08/2024	27/08/2024	27/08/2024	27/08/2024
	Date of Analysis		29/08/2024	29/08/2024	29/08/2024	29/08/2024
	Date of Analysis Completion		07/09/2024	07/09/2024	07/09/2024	07/09/2024
1	Textural Class	----	Sandy Clay	Sandy Clay	Sandy Clay	Sandy Clay
a	Sand	%	50	53	49	51
b	Silt	%	17	18	20	15
c	Clay	%	33	29	31	34
2	Bulk Density	g/cc	1.32	1.28	1.34	1.25
3	pH (1:5 Aq. Extraction)	----	7.24	7.65	7.81	7.47
4	Conductivity (1:5 Aq. Extraction)	µS/cm	451	505	378	423
5	Exchangeable Calcium as Ca	mg/kg	1023	1345	2275	1509
6	Exchangeable Magnesium as Mg	mg/kg	893	1045	1519	1056
7	Exchangeable Sodium as Na	mg/kg	198	115	134	206
8	Sodium Absorption Ratio (SAR)	----	0.80	0.71	0.86	0.74
9	Available Nitrogen as N	Kg/hac	56.3	93.2	77.4	62.3
10	Available Phosphorous as P	Kg/hac	127.3	176.2	108.3	99.4
11	Available Potassium as K	Kg/hac	289.3	308.2	266.3	342.3
12	Organic Carbon	%	0.56	0.61	0.44	0.51
13	Organic Matter	%	0.97	1.06	0.76	0.88
14	Water Soluble Chlorides as Cl	mg/kg	141.2	127.3	139.4	163.2
15	Water Soluble Sulphates as SO ₄	mg/kg	109.3	93.4	88.3	123.2
16	Aluminium	%	1.04	0.73	0.91	0.84
17	Total Iron	%	0.84	0.88	1.05	1.11
18	Manganese	mg/kg	235	308	521	452
19	Boron	mg/kg	23.4	17.3	28.4	20.8
20	Zinc	mg/kg	34.2	28.4	29.3	19.4
21	Total Chromium as Cr	mg/kg	13.5	18.3	10.5	16.3
22	Lead as Pb	mg/kg	<0.1	<0.1	<0.1	<0.1
23	Nickel as Ni	mg/kg	9.3	10.3	14.3	9.7
24	Arsenic as As	mg/kg	<0.1	<0.1	<0.1	<0.1
25	Mercury as Hg	mg/kg	<0.1	<0.1	<0.1	<0.1
26	Cadmium as Cd	mg/kg	<0.1	<0.1	<0.1	<0.1
27	Exchangeable Calcium	meq/100g	31.3	23.6	39.4	22.3
28	Exchangeable Magnesium	meq/100g	13.4	17.2	20.5	15.3
29	Exchangeable Sodium	meq/100g	14.2	10.2	22.4	10.3
30	Exchangeable Potassium	meq/100g	8.3	9.4	3.2	2.8
31	Cation Exchange Capacity	meq/100g	67.2	60.4	85.5	50.7

Soil Sampling Locations

S1. Tarod Village

S 2. Rogda Village

S 3. Banahill Village

S4. Jhalmala Village



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TABLE-20
SOIL QUALITY RESULTS

Sr. No	Parameters	Unit	S5	S6	S7	S8
	Sampling Date		27/08/2024	27/08/2024	27/08/2024	27/08/2024
	Date of Analysis		29/08/2024	29/08/2024	29/08/2024	29/08/2024
	Date of Analysis Completion		07/09/2024	07/09/2024	07/09/2024	07/09/2024
1	Textural Class	----	Sandy Clay	Sandy Clay	Sandy Clay	Sandy Clay
a	Sand	%	48	55	52	49
b	Silt	%	19	16	15	17
c	Clay	%	33	29	33	34
2	Bulk Density	g/cc	1.28	1.31	1.35	1.26
3	pH (1:5 Aq. Extraction)	----	7.73	7.34	7.54	7.43
4	Conductivity (1:5 Aq. Extraction)	µS/cm	482	366	515	397
5	Exchangeable Calcium as Ca	mg/kg	1083	2782	1277	982
6	Exchangeable Magnesium as Mg	mg/kg	772	1867	935	621
7	Exchangeable Sodium as Na	mg/kg	148	321	208	188
8	Sodium Absorption Ratio (SAR)	----	0.77	0.76	0.87	0.66
9	Available Nitrogen as N	Kg/hac	55.8	91.4	67.3	72.5
10	Available Phosphorous as P	Kg/hac	132.2	109.3	126.4	140.2
11	Available Potassium as K	Kg/hac	186.2	217.3	227.3	275.3
12	Organic Carbon	%	0.65	0.39	0.57	0.44
13	Organic Matter	%	1.12	0.67	0.99	0.76
14	Water Soluble Chlorides as Cl	mg/kg	122.5	173.4	148.2	152.3
15	Water Soluble Sulphates as SO ₄	mg/kg	95.3	76.4	92.5	101.5
16	Aluminium	%	0.67	0.88	0.74	0.83
17	Total Iron	%	0.82	0.69	0.89	0.96
18	Manganese	mg/kg	298	317	298	366
19	Boron	mg/kg	19.5	15.4	22.8	19.4
20	Zinc	mg/kg	21.5	26.3	18.3	22.5
21	Total Chromium as Cr	mg/kg	11.3	21.3	13.9	18.4
22	Lead as Pb	mg/kg	<0.1	<0.1	<0.1	<0.1
23	Nickel as Ni	mg/kg	13.2	10.7	15.3	8.7
24	Arsenic as As	mg/kg	<0.1	<0.1	<0.1	<0.1
25	Mercury as Hg	mg/kg	<0.1	<0.1	<0.1	<0.1
26	Cadmium as Cd	mg/kg	<0.1	<0.1	<0.1	<0.1
27	Exchangeable Calcium	meq/100g	19.4	38.2	24.1	31.8
28	Exchangeable Magnesium	meq/100g	11.8	18.3	10.4	14.7
29	Exchangeable Sodium	meq/100g	9.3	16.2	13.2	10.2
30	Exchangeable Potassium	meq/100g	4.1	8.3	6.3	5.3
31	Cation Exchange Capacity	meq/100g	44.6	81.0	54.0	62.0

Soil Sampling Locations

S5. Amora Village
S6. Sonsari Village
S7. Akaltara Village
S8. Nariyara Village

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7.7 Stack Emission Monitoring

The power plant has stack of height 275.0-m, which is the major source of air pollution. The stack emission monitoring for Unit – II & Unit - IV has been carried out and results are given in **Table-21 and 22.**

TABLE-21
STACK EMISSION MONITORING UNIT -II

Sr. No.	Parameters	UOM	Result	Methods
Date Of Sampling :19/08/2024				
Sampling Time : 11.00 to 12.00 hrs				
Duration Of sampling : 60 mints				
Date of sample analysis : 21/08/2024				
Details of the source				
1	Capacity	MW	600	-
2	Stack Height	M	275	-
3	Duct Dimension	M	7.0	-
4	Duct area	m ²	38	-
Flue Gas Characteristics				
5	Temperature	°C	120	USEPA 1,2,3&4
6	Velocity	m/s	22.14	USEPA 1,2,3&4
7	Volumetric Flow Rate	Nm ³ /s	635.74	USEPA 1,2,3&4
8	Particulate Matter	mg/Nm ³	26.72	USEPA 5
9	Sulfur dioxide	mg/Nm ³	962	USEPA 6
10	Oxides of Nitrogen	mg/Nm ³	386	USEPA 7
11	Arsenic as As	mg/Nm ³	0.023	USEPA method -29
12	Cadmium as Cd	mg/Nm ³	0.018	USEPA method -29
13	Cobalt as Co	mg/Nm ³	<0.001	USEPA method -29
14	Nickel as Ni	mg/Nm ³	0.027	USEPA method -29
15	Copper as Cu	mg/Nm ³	0.032	USEPA method -29
16	Mercury as Hg	mg/Nm ³	0.009	USEPA method -29
17	Chromium as Cr	mg/Nm ³	0.025	USEPA method -29
18	Manganese as Mn	mg/Nm ³	0.033	USEPA method -29
19	Antimony as Sb	mg/Nm ³	<0.001	USEPA method -29
20	Lead as Pb	mg/Nm ³	0.029	USEPA method -29
21	Thallium as TI	mg/Nm ³	<0.001	USEPA method -29
22	Vanadium as V	mg/Nm ³	<0.001	USEPA method -29

The results indicate that the PM is observed as 26.72 mg/Nm³.


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TABLE-22
STACK EMISSION MONITORING UNIT -IV

Sr. No.	Parameters	UOM	Result	Methods
Date Of Sampling : 26/08/2024				
Sampling Time : 11.30 to 12.30 hrs				
Duration Of sampling : 60 mints				
Date of sample analysis : 28/08/2024				
Details of the source				
1	Capacity	MW	600	-
2	Stack Height	M	275	-
3	Duct Dimension	M	7.0	-
4	Duct area	m ²	38	-
Flue Gas Characteristics				
5	Temperature	°C	110	USEPA 1,2,3&4
6	Velocity	m/s	23.53	USEPA 1,2,3&4
7	Volumetric Flow Rate	Nm ³ /s	652.45	USEPA 1,2,3&4
8	Particulate Matter	mg/Nm ³	11.89	USEPA 5
9	Sulfur dioxide	mg/Nm ³	985	USEPA 6
10	Oxides of Nitrogen	mg/Nm ³	388	USEPA 7
11	Arsenic as As	mg/Nm ³	0.024	USEPA method -29
12	Cadmium as Cd	mg/Nm ³	0.020	USEPA method -29
13	Cobalt as Co	mg/Nm ³	<0.001	USEPA method -29
14	Nickel as Ni	mg/Nm ³	0.037	USEPA method -29
15	Copper as Cu	mg/Nm ³	0.040	USEPA method -29
16	Mercury as Hg	mg/Nm ³	0.009	USEPA method -29
17	Chromium as Cr	mg/Nm ³	0.032	USEPA method -29
18	Manganese as Mn	mg/Nm ³	0.028	USEPA method -29
19	Antimony as Sb	mg/Nm ³	<0.001	USEPA method -29
20	Lead as Pb	mg/Nm ³	0.029	USEPA method -29
21	Thallium as TI	mg/Nm ³	<0.001	USEPA method -29
22	Vanadium as V	mg/Nm ³	<0.001	USEPA method -29

The results indicate that the PM is observed as 11.89 mg/Nm³.

ENVIRONMENTAL MONITORING REPORT
FOR
6x600 MW COAL BASED POWER PLANT
OF KSK MAHANADI POWER COMPANY LTD
AT NARIYARA, JANJGIR-CHAMPA DISTRICT, CHHATTISGARH

MONTHLY REPORT: SEPTEMBER-2024

Client:

KSK Mahanadi Power Company Ltd
Nariyara, Chhattisgarh

Prepared by:



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6.0 QUALITY ASSURANCE

Vimta Labs Ltd is accredited by NABL Govt. of India and follows quality systems as per ISO/IEC 17025-2017. The QA/QC procedures are laid prior to sample collection and laboratory analysis. It includes the standard procedures of sample collection, preservation, transportation and laboratory analysis with all documented procedures and continuous monitoring of Quality Control division.

7.0 RESULTS OF SURVEY DATA

The monitoring results of Ambient Air Quality analysis for the month of **August-2024** are presented in below **Table-6 to Table-10**.

7.1 Ambient Air Quality Monitoring Results

TABLE-6
AAO MONITORING RESULTS

Monitoring Date	PM2.5	PM10	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³
	Particulate Matter(µg/m ³)				
BTG area – AAQ1					
03.09.2024	40.1	61.4	13.5	15.8	0.234
06.09.2024	39.8	57.6	14.4	16.8	0.268
11.09.2024	38.2	67.8	13.9	15.5	0.217
13.09.2024	44.3	54.9	15.2	16.9	0.261
19.09.2024	45.8	65.2	14.3	14.7	0.237
24.09.2024	38.8	56.8	15.3	16.9	0.256
27.09.2024	41.4	59.3	13.3	14.6	0.238
Max	45.8	67.8	15.3	16.9	0.268
Min	38.2	54.9	13.3	14.6	0.217
Avg	41.2	60.4	14.3	15.9	0.244
98%ile	45.6	67.5	15.3	16.9	0.267
CHP area – AAQ2					
03.09.2024	39.5	70.3	15.0	16.8	0.248
06.09.2024	42.0	67.7	15.8	18.0	0.307
11.09.2024	44.8	75.4	13.6	15.5	0.264
13.09.2024	43.0	71.5	15.9	17.5	0.305
19.09.2024	47.3	74.2	14.1	16.6	0.297
24.09.2024	42.3	68.4	18.5	20.5	0.277
27.09.2024	49.6	73.8	16.4	18.3	0.308
Max	49.6	75.4	18.5	20.5	0.308
Min	39.5	67.7	13.6	15.5	0.248
Avg	44.1	71.6	15.6	17.6	0.287
98%ile	49.3	75.3	18.4	20.2	0.308
DM plant area – AAQ3					
03.09.2024	42.5	60.4	12.7	14.4	0.213
06.09.2024	33.7	55.5	14.4	15.5	0.228
11.09.2024	38.3	62.5	11.8	13.8	0.207
13.09.2024	37.0	51.3	14.0	15.3	0.239
19.09.2024	38.5	61.4	13.1	14.4	0.229
24.09.2024	42.7	57.8	14.8	15.7	0.248
27.09.2024	40.7	62.7	12.2	14.4	0.217
Max	42.7	62.7	14.8	15.7	0.248
Min	33.7	51.3	11.8	13.8	0.207
Avg	39.1	58.8	13.3	14.8	0.226
98%ile	42.7	62.7	14.8	15.7	0.247

	Monthly Environmental Monitoring Report for 6x600 MW Coal Based Power Plant of KSK Mahanadi Power Company Limited at Nariyara Village, Janjgir-Champa District, Chhattisgarh <p style="text-align: right;">September 2024</p>
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TABLE-7
AAO MONITORING RESULTS

Monitoring Date	PM2.5	PM10	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³
	Particulate				
Ash handling area – AAQ4					
03.09.2024	48.1	74.9	13.7	15.7	0.273
06.09.2024	39.4	67.0	15.3	18.3	0.313
11.09.2024	47.0	74.4	13.4	17.2	0.308
13.09.2024	44.5	73.6	16.3	19.5	0.323
19.09.2024	48.2	75.0	14.5	17.2	0.280
24.09.2024	40.2	64.3	17.3	19.4	0.303
27.09.2024	45.2	62.3	16.3	18.0	0.281
Max	48.2	75.0	17.3	19.5	0.323
Min	39.4	62.3	13.4	15.7	0.273
Avg	44.7	70.2	15.3	17.9	0.297
98%le	48.2	75.0	17.2	19.5	0.322
Tarod Village – AAQ5					
03.09.2024	31.9	58.7	12.8	14.1	0.163
06.09.2024	29.0	56.2	10.9	12.6	0.141
11.09.2024	33.5	57.2	13.4	14.5	0.156
13.09.2024	29.7	60.3	9.9	11.9	0.137
19.09.2024	36.4	56.2	11.5	13.6	0.167
24.09.2024	30.9	53.5	11.9	12.1	0.148
27.09.2024	27.3	50.8	12.4	14.2	0.139
Max	36.4	60.3	13.4	14.5	0.167
Min	27.3	50.8	9.9	11.9	0.137
Avg	31.2	56.1	11.8	13.3	0.150
98%le	36.1	60.1	13.3	14.5	0.167
Jhalmala Village- AAQ6					
03.09.2024	31.8	54.8	11.0	13.7	0.142
06.09.2024	29.6	52.8	9.8	12.0	0.155
11.09.2024	35.7	53.3	10.5	13.5	0.129
13.09.2024	29.9	50.8	11.3	12.8	0.138
19.09.2024	31.9	52.1	10.6	14.1	0.160
24.09.2024	29.6	50.3	8.9	12.4	0.140
27.09.2024	27.4	48.5	11.4	13.5	0.156
Max	35.7	54.8	11.4	14.1	0.160
Min	27.4	48.5	8.9	12.0	0.129
Avg	30.8	51.8	10.5	13.1	0.146
98%le	35.2	54.6	11.4	14.1	0.160
Amora Village - AAQ7					
03.09.2024	32.0	59.5	12.8	13.7	0.157
06.09.2024	31.5	53.1	9.3	12.8	0.145
11.09.2024	33.5	61.7	13.7	14.3	0.127
13.09.2024	28.5	51.8	8.7	13.3	0.148
19.09.2024	29.7	62.8	12.4	14.8	0.162
24.09.2024	33.0	52.4	9.2	13.5	0.157
27.09.2024	27.5	58.3	11.4	14.3	0.138
Max	33.5	62.8	13.7	14.8	0.162
Min	27.5	51.8	8.7	12.8	0.127
Avg	30.8	57.1	11.1	13.8	0.148
98%le	33.4	62.7	13.6	14.7	0.161
Limits as per NAAQS	60	100	80	80	02

 KSK Power from knowledge	Monthly Environmental Monitoring Report for 6x600 MW Coal Based Power Plant of KSK Mahanadi Power Company Limited at Nariyara Village, Janjgir-Champa District, Chhattisgarh <p style="text-align: right;">September 2024</p>
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TABLE-8
AAQ MONITORING RESULTS

Monitoring Date	PM2.5	PM10	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³
	Particulate				
Sonsari Village - AAQ8					
03.09.2024	28.2	57.2	11.6	13.5	0.139
06.09.2024	29.4	59.3	12.1	14.1	0.114
11.09.2024	33.2	55.3	12.4	12.8	0.124
13.09.2024	31.7	52.6	9.5	13.2	0.156
19.09.2024	34.2	60.1	11.5	12.8	0.130
24.09.2024	28.4	53.2	12.2	14.2	0.122
27.09.2024	33.8	57.3	11.2	13.5	0.142
Max	34.2	60.1	12.4	14.2	0.156
Min	28.2	52.6	9.5	12.8	0.114
Avg	31.3	56.4	11.5	13.4	0.132
98%ile	34.2	60.0	12.4	14.2	0.154
Nariyara Village – AAQ9					
03.09.2024	33.2	56.0	11.7	13.8	0.121
06.09.2024	28.2	52.8	10.6	12.6	0.115
11.09.2024	29.6	52.6	9.9	13.5	0.145
13.09.2024	31.1	52.3	10.2	12.8	0.122
19.09.2024	29.7	55.4	11.9	13.6	0.149
24.09.2024	30.7	51.7	10.4	13.2	0.118
27.09.2024	32.8	56.3	9.8	12.2	0.132
Max	33.2	56.3	11.9	13.8	0.149
Min	28.2	51.7	9.8	12.2	0.115
Avg	30.8	53.9	10.6	13.1	0.129
98%ile	33.2	56.3	11.9	13.8	0.149
Limits as per NAAQS	60	100	80	80	02

Teflon filter paper was used in PM2.5 & whatman filter paper for PM10 weighed in Mettler electronic balance and computed as per standard methods PM2.5, PM10, SO₂, NO_x is monitored on 24 hrs. Basis CO is monitored on 8 hours basis All the values are expressed in µg/m³ except CO is measured in mg/m³

 KSK Power from knowledge	Monthly Environmental Monitoring Report for 6x600 MW Coal Based Power Plant of KSK Mahanadi Power Company Limited at Nariyara Village, Janjgir-Champa District, Chhattisgarh
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TABLE-9
AAQ MONITORING RESULTS

Monitoring Date & Location	Arsenic ng/m ³	Nickel ng/m ³	Lead µg/m ³	O ₃ µg/m ³	NH ₃ µg/m ³	C ₆ H ₆ µg/m ³	Benzo(a) Pyrene ng/m ³	Hg µg/m ³
BTG area – AAQ1								
03.09.2024	<1.0	<1.0	<0.001	10.2	<20	<1.0	<0.1	<0.001
06.09.2024	<1.0	1.6	0.003	9.3	<20	<1.0	<0.1	<0.001
11.09.2024	<1.0	1.3	0.001	10.0	<20	<1.0	<0.1	<0.001
13.09.2024	<1.0	<1.0	<0.001	9.7	<20	<1.0	<0.1	<0.001
19.09.2024	<1.0	1.8	0.002	12.1	<20	<1.0	<0.1	<0.001
24.09.2024	<1.0	2.3	0.004	9.4	<20	<1.0	<0.1	<0.001
27.09.2024	<1.0	1.5	0.003	8.5	<20	<1.0	<0.1	<0.001
Max	<1.0	2.3	0.004	12.1	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	8.5	<20	<1.0	<0.1	<0.001
Avg	<1.0	1.7	0.003	9.9	<20	<1.0	<0.1	<0.001
98%	<1.0	2.3	0.004	11.9	<20	<1.0	<0.1	<0.001
CHP area – AAQ2								
03.09.2024	<1.0	1.5	0.003	9.5	<20	<1.0	<0.1	<0.001
06.09.2024	<1.0	2.6	0.001	10.3	<20	<1.0	<0.1	<0.001
11.09.2024	<1.0	2.1	0.005	12.5	<20	<1.0	<0.1	<0.001
13.09.2024	<1.0	1.9	<0.001	11.5	<20	<1.0	<0.1	<0.001
19.09.2024	<1.0	2.8	0.003	10.8	<20	<1.0	<0.1	<0.001
24.09.2024	<1.0	2.4	0.004	13.4	<20	<1.0	<0.1	<0.001
27.09.2024	<1.0	1.7	0.006	12.7	<20	<1.0	<0.1	<0.001
Max	<1.0	2.8	0.006	13.4	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	9.5	<20	<1.0	<0.1	<0.001
Avg	<1.0	2.1	0.004	11.5	<20	<1.0	<0.1	<0.001
98%	<1.0	2.8	0.006	13.3	<20	<1.0	<0.1	<0.001
DM plant area – AAQ3								
03.09.2024	<1.0	1.4	0.003	9.7	<20	<1.0	<0.1	<0.001
06.09.2024	<1.0	<1.0	<0.001	8.4	<20	<1.0	<0.1	<0.001
11.09.2024	<1.0	1.2	0.003	10.5	<20	<1.0	<0.1	<0.001
13.09.2024	<1.0	1.8	0.001	8.8	<20	<1.0	<0.1	<0.001
19.09.2024	<1.0	1.5	0.003	10.0	<20	<1.0	<0.1	<0.001
24.09.2024	<1.0	1.0	0.002	9.3	<20	<1.0	<0.1	<0.001
27.09.2024	<1.0	1.7	<0.001	10.2	<20	<1.0	<0.1	<0.001
Max	<1.0	1.8	0.003	10.5	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	8.4	<20	<1.0	<0.1	<0.001
Avg	<1.0	1.5	0.002	9.6	<20	<1.0	<0.1	<0.001
98%	<1.0	1.8	0.003	10.5	<20	<1.0	<0.1	<0.001
Limits as per	06	20	1.0	100	400	05	01	-

Below Detectable Limit for as and Ni 1.0 ng/m³ Below Detectable Limit for Pb 0.001 µg/m³ Ozone and CO is monitored on 8 hours basis Below Detectable Limit for O₃ 50 µg/m³ Below Detectable Limit for NH₃ 20 µg/m³

 KSK Power from knowledge	Monthly Environmental Monitoring Report for 6x600 MW Coal Based Power Plant of KSK Mahanadi Power Company Limited at Nariyara Village, Janjgir-Champa District, Chhattisgarh <p style="text-align: right;">September 2024</p>
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TABLE-10
AAQ MONITORING RESULTS

Monitoring Date & Location	Arsenic ng/m ³	Nickel ng/m ³	Lead µg/m ³	O ₃ µg/m ³	NH ₃ µg/m ³	C ₆ H ₆ µg/m ³	Benzo(a) Pyrene ng/m ³	Hg µg/m ³
Ash handling area – AAQ4								
03.09.2024	<1.0	<1.0	0.003	13.4	<20	<1.0	<0.1	<0.001
06.09.2024	<1.0	2.4	0.004	11.5	<20	<1.0	<0.1	<0.001
11.09.2024	<1.0	1.6	<0.001	12.1	<20	<1.0	<0.1	<0.001
13.09.2024	<1.0	3.2	0.004	9.7	<20	<1.0	<0.1	<0.001
19.09.2024	<1.0	2.2	0.003	10.6	<20	<1.0	<0.1	<0.001
24.09.2024	<1.0	1.6	0.001	13.6	<20	<1.0	<0.1	<0.001
27.09.2024	<1.0	2.9	0.005	14.3	<20	<1.0	<0.1	<0.001
Max	<1.0	3.2	0.005	14.3	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	9.7	<20	<1.0	<0.1	<0.001
Avg	<1.0	2.3	0.003	12.2	<20	<1.0	<0.1	<0.001
98%	<1.0	3.2	0.005	14.2	<20	<1.0	<0.1	<0.001
Tarod Village – AAQ5								
03.09.2024	<1.0	<1.0	<0.001	6.8	<20	<1.0	<0.1	<0.001
06.09.2024	<1.0	<1.0	<0.001	7.5	<20	<1.0	<0.1	<0.001
11.09.2024	<1.0	<1.0	<0.001	8.0	<20	<1.0	<0.1	<0.001
13.09.2024	<1.0	<1.0	<0.001	6.2	<20	<1.0	<0.1	<0.001
19.09.2024	<1.0	<1.0	<0.001	5.2	<20	<1.0	<0.1	<0.001
24.09.2024	<1.0	<1.0	<0.001	6.8	<20	<1.0	<0.1	<0.001
27.09.2024	<1.0	<1.0	<0.001	4.8	<20	<1.0	<0.1	<0.001
Max	<1.0	<1.0	<0.001	8.0	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	5.2	<20	<1.0	<0.1	<0.001
Avg	<1.0	<1.0	<0.001	6.8	<20	<1.0	<0.1	<0.001
98%	<1.0	<1.0	<0.001	8.0	<20	<1.0	<0.1	<0.001
Jhalmala Village- AAQ-6								
03.09.2024	<1.0	<1.0	<0.001	5.3	<20	<1.0	<0.1	<0.001
06.09.2024	<1.0	<1.0	<0.001	6.2	<20	<1.0	<0.1	<0.001
11.09.2024	<1.0	<1.0	<0.001	4.5	<20	<1.0	<0.1	<0.001
13.09.2024	<1.0	<1.0	<0.001	6.3	<20	<1.0	<0.1	<0.001
19.09.2024	<1.0	<1.0	<0.001	4.9	<20	<1.0	<0.1	<0.001
24.09.2024	<1.0	<1.0	<0.001	5.6	<20	<1.0	<0.1	<0.001
27.09.2024	<1.0	<1.0	<0.001	6.8	<20	<1.0	<0.1	<0.001
Max	<1.0	<1.0	<0.001	6.8	<20	<1.0	<0.1	<0.001
Min	<1.0	<1.0	<0.001	4.5	<20	<1.0	<0.1	<0.001
Avg	<1.0	<1.0	<0.001	5.7	<20	<1.0	<0.1	<0.001
98%	<1.0	<1.0	<0.001	6.7	<20	<1.0	<0.1	<0.001
Limits as per	06	20	1.0	100	400	05	01	-

Below Detectable Limit for as and Ni 1.0 ng/m³ Below Detectable Limit for Pb 0.001 µg/m³ Ozone and CO is monitored on 8 hours basis Below Detectable Limit for O₃ 50 µg/m³ Below Detectable Limit for NH₃ 20 µg/m³


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TABLE-11
AAQ MONITORING RESULTS

Monitoring Date & Location	Arsenic ng/m ³	Nickel ng/m ³	Lead µg/m ³	O ₃ µg/m ³	NH ₃ µg/m ³	C ₆ H ₆ µg/m ³	Benzo(a) Pyrene ng/m ³	Hg µg/m ³
Amora Village – AAQ7								
03.09.2024	<1.0	<1.0	<0.001	5.2	<20	<1.0	<0.1	<0.001
06.09.2024	<1.0	<1.0	<0.001	6.0	<20	<1.0	<0.1	<0.001
11.09.2024	<1.0	<1.0	<0.001	4.6	<20	<1.0	<0.1	<0.001
13.09.2024	<1.0	<1.0	<0.001	5.8	<20	<1.0	<0.1	<0.001
19.09.2024	<1.0	<1.0	<0.001	7.0	<20	<1.0	<0.1	<0.001
24.09.2024	<1.0	<1.0	<0.001	6.0	<20	<1.0	<0.1	<0.001
27.09.2024	<1.0	<1.0	<0.001	4.8	<20	<1.0	<0.1	<0.001
Max	<1.0	<1.0	<0.001	7.0	<20	<1.0	<0.1	<0.00
Min	<1.0	<1.0	<0.001	4.6	<20	<1.0	<0.1	<0.00
Avg	<1.0	<1.0	<0.001	5.6	<20	<1.0	<0.1	<0.00
98%	<1.0	<1.0	<0.001	6.9	<20	<1.0	<0.1	<0.00
Sonsari Village – AAQ8								
03.09.2024	<1.0	<1.0	<0.001	6.3	<20	<1.0	<0.1	<0.001
06.09.2024	<1.0	<1.0	<0.001	7.4	<20	<1.0	<0.1	<0.001
11.09.2024	<1.0	<1.0	<0.001	4.8	<20	<1.0	<0.1	<0.001
13.09.2024	<1.0	<1.0	<0.001	7.1	<20	<1.0	<0.1	<0.001
19.09.2024	<1.0	<1.0	<0.001	6.5	<20	<1.0	<0.1	<0.001
24.09.2024	<1.0	<1.0	<0.001	5.4	<20	<1.0	<0.1	<0.001
27.09.2024	<1.0	<1.0	<0.001	4.7	<20	<1.0	<0.1	<0.001
Max	<1.0	<1.0	<0.001	7.4	<20	<1.0	<0.1	<0.00
Min	<1.0	<1.0	<0.001	6.3	<20	<1.0	<0.1	<0.00
Avg	<1.0	<1.0	<0.001	7.4	<20	<1.0	<0.1	<0.00
98%	<1.0	<1.0	<0.001	4.8	<20	<1.0	<0.1	<0.00
Nariyara Village – AAQ9								
03.09.2024	<1.0	<1.0	<0.001	6.7	<20	<1.0	<0.1	<0.001
06.09.2024	<1.0	<1.0	<0.001	5.7	<20	<1.0	<0.1	<0.001
11.09.2024	<1.0	<1.0	<0.001	6.4	<20	<1.0	<0.1	<0.001
13.09.2024	<1.0	<1.0	<0.001	5.1	<20	<1.0	<0.1	<0.001
19.09.2024	<1.0	<1.0	<0.001	5.9	<20	<1.0	<0.1	<0.001
24.09.2024	<1.0	<1.0	<0.001	4.7	<20	<1.0	<0.1	<0.001
27.09.2024	<1.0	<1.0	<0.001	6.2	<20	<1.0	<0.1	<0.001
Max	<1.0	<1.0	<0.001	6.7	<20	<1.0	<0.1	<0.00
Min	<1.0	<1.0	<0.001	4.7	<20	<1.0	<0.1	<0.00
Avg	<1.0	<1.0	<0.001	5.8	<20	<1.0	<0.1	<0.00
98%	<1.0	<1.0	<0.001	6.7	<20	<1.0	<0.1	<0.00
Limits as per	06	20	1.0	100	400	05	01	-

Below Detectable Limit for as and Ni 1.0 ng/m³ · Below Detectable Limit for Pb 0.001 µg/m³ Ozone and CO is monitored on 8 hours basis Below Detectable Limit for O₃ 50 µg/m³ Below Detectable Limit for NH₃ 20 µg/m³

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7.1.1 Observations (Inside the premises)

PM_{2.5}: The maximum value for PM_{2.5} observed at CHP area as 49.6 µg /m³ and minimum value for PM_{2.5} at DM plant area as 33.7 µg/m³. The 24 hours applicable limit inside the plant premises 60 µg /m³ for industrial area.

PM₁₀: The maximum value for PM₁₀ observed at CHP area as 75.4 µg /m³ and minimum value for PM₁₀ at DM Plant area as 51.3 µg/m³. The 24 hours applicable limit inside the plant premises 100 µg /m³ for industrial area.

SO₂: The maximum value for SO₂ observed at CHP plant area as 18.5 µg /m³ and minimum value for SO₂ at DM Plant area as 11.8 µg /m³. The 24 hours applicable limit inside the plant premises 80 µg /m³ for industrial area.

NO₂: The maximum value for NO₂ observed at CHP area as 20.5 µg /m³ and minimum value for NO₂ at DM Plant area as 13.8 µg/m³. The 24 hours applicable limit inside the plant premises 80 µg /m³ for industrial area.

CO: The maximum value for CO observed at AHP area as 0.323 mg/m³ and minimum value for CO at DM plant as 0.207 mg/m³. The 8 hours applicable limit inside the plant premises 02 mg/m³ for industrial area.

Ammonia: The maximum and minimum value for Ammonia observed at all the locations as <20 µg /m³. The 24 hours' applicable limit inside the plant premises 400 µg /m³ for industrial area

Nickel: The maximum value for Nickel observed at AHP area as 3.2 ng /m³ and <1.0 ng /m minimum value for BTG, DM, CHP & AHP Plant area. The 24 hours' applicable limit inside the plant premises 20 ng/m³ for industrial area.

Arsenic: The maximum and minimum value for Arsenic observed at all the locations as <1.0 ng /m³. The 24 hours applicable limit inside the plant premises 6 ng/m³ for industrial area

Lead: The maximum value for Lead observed at CHP area as 0.006 µg/m³ and minimum value for BTG, DM, CHP & AHP Plant area as <0.001 µg /m³. The 24 hours' applicable limit inside the plant premises 1 µg/m³ for industrial area.

Ozone: The maximum value for Ozone observed at AHP area as 14.3 µg/m³ and minimum value for Ozone DM Plant Plant area as 8.4 µg /m³. The 8 hours' applicable limit inside the plant premises 100 µg /m³ for industrial area.

Benzo(a)Pyrene: The maximum and minimum value for Benzo(a)Pyrene observed at all the locations as <0.1 ng /m³. The 24 hours applicable limit inside the plant premises 1 ng/m³ for industrial area

Benzene: The maximum and minimum value for Benzene observed at all the locations as <1.0 µg /m³. The 24 hours applicable limit inside the plant premises 5 µg /m³ for industrial area

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Mercury: The maximum and minimum value for Mercury observed at all the locations as $<0.001 \mu\text{g} / \text{m}^3$ for 24 hours.

7.1.2 Observations (Outside the premises)

PM_{2.5}: The maximum value for PM_{2.5} observed at tarod village as $36.4 \mu\text{g} / \text{m}^3$ and minimum value for PM_{2.5} at Jhalmala village as $27.4 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $60 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

PM₁₀: The maximum value for PM₁₀ observed at Amora village as $62.8 \mu\text{g} / \text{m}^3$ and minimum value for PM₁₀ at Jhalmala village as $48.5 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $100 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

SO₂: The maximum value for SO₂ observed at Amora village as $13.7 \mu\text{g} / \text{m}^3$ and minimum value for SO₂ at Amora village as $8.7 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the Plant premises $80 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

NO_x: The maximum value for NO_x observed at Amora village as $14.4 \mu\text{g} / \text{m}^3$ and minimum value for NO_x at Tarod village as $11.9 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $80 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

CO: The maximum value for CO observed at Tarod village as $0.167 \text{ mg} / \text{m}^3$ and minimum value for CO at Sonsari village as $0.114 \text{ mg} / \text{m}^3$. The 8 hours' applicable limit outside the plant premises $02 \text{ mg} / \text{m}^3$ for Rural/Residential area.

Ammonia: The maximum and minimum value for Ammonia observed at all the locations as $<20 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $400 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

Nickel: The maximum and minimum value for Nickel observed at all the locations as $<1.0 \text{ ng} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $20 \text{ ng} / \text{m}^3$ for Rural/Residential area.

Arsenic: The maximum and minimum value for Arsenic observed at all the locations as $<1.0 \text{ ng} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $6 \text{ ng} / \text{m}^3$ for Rural/Residential area.

Lead: The maximum and minimum value for Lead observed at all the locations as $<0.001 \mu\text{g} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $1 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

Ozone: The maximum value for Ozone observed at Tarod village as $8.0 \mu\text{g} / \text{m}^3$ and minimum value for Ozone at Sonsari village as $4.7 \mu\text{g} / \text{m}^3$. The 8 hours applicable limit outside the plant premises $100 \mu\text{g} / \text{m}^3$ for Rural/Residential area.

Benzo(a)Pyrene: The maximum and minimum value for Benzo(a)Pyrene observed at all the locations as $<0.1 \text{ ng} / \text{m}^3$. The 24 hours applicable limit outside the plant premises $1 \text{ ng} / \text{m}^3$ for Rural/Residential area.

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Benzene: The maximum and minimum value for Benzene observed at all the locations as $<1.0 \mu\text{g}/\text{m}^3$. The 24 hours applicable limit outside the plant premises $5 \mu\text{g}/\text{m}^3$ for Rural/Residential area

Mercury: The maximum and minimum value for Mercury observed at all the locations as $<0.001 \mu\text{g}/\text{m}^3$ for 24 hours.

Results and conclusions:

The results of the monitored data indicate that the ambient air quality of the region in general is conformity with respect to norms of National Ambient Air Quality standards of CPCB, at all locations monitored.

7.2 Noise Monitoring

7.2.1 Source Noise Monitoring – Inside the Plant Premises

The spot noise levels observed inside the premises at various locations is given in **Table-12**

TABLE-12
INDUSTRIAL NOISE LEVELS IN WORK ENVIRONMENT

Sr. No	Code	Location	Date of sampling	Noise Level L_{eq} [dB(A)]
1	N1	TG floor	09/09/2024	84.1
2	N2	Cooling tower#3	02/09/2024	72.7
3	N3	Main Gate	02/09/2024	66.0
4	N4	Boiler feed pump	09/09/2024	83.5
5	N5	Admin Building area	02/09/2024	54.5
6	N6	CHP Machine area	23/09/2024	82.5
7	N7	AHP area	09/09/2024	83.4
8	N8	Ash Silo area	09/09/2024	82.0
9	N9	CW Pump house	02/09/2024	83.7
10	N10	Compressor 1	23/09/2024	83.2
11	N11	Compressor 2	23/09/2024	84.0
12	N12	Compressor 3	23/09/2024	83.4
13	N13	Compressor 4	23/09/2024	84.2

7.2.1.1 Observations

The industrial noise levels within the premises at Work Zone area are observed to be in the range of 54.5 to 84.2 dB (A), which are within the prescribed limit of 85 dB (A).

7.2.3 Noise Monitoring – Outside the Premises

The statistical analysis is done for measured noise levels at four locations in the study area. The parameters are analyzed for L_{day} , L_{night} , and L_{dn} . The statistical analysis results are given in **Table-13**.

TABLE-13
AMBIENT NOISE LEVELS IN THE STUDY AREA

All the values are given in dB (A)

Code	Location	Date of sampling	L_{10}	L_{50}	L_{90}	L_{eq}	L_{day}	L_{night}	L_{dn}
N14	Banahill Village	03.09.2024	51.9	48.0	44.3	49.0	49.8	41.7	48.1
N15	Tarod Village	27.09.2024	54.3	50.4	46.7	51.4	52.2	43.2	50.2
N16	Rogda Village	24.09.2024	50.8	46.9	43.2	47.9	48.7	42.0	46.5
N17	Jhalmala Village	06.09.2024	51.4	47.5	43.8	48.5	49.3	41.6	47.1
N18	Nariyara Village	10.09.2024	53.7	49.8	46.1	50.8	51.6	43.3	48.7
N19	Sonsari Village	13.09.2024	51.8	47.9	44.2	48.9	49.7	41.5	47.6
N20	Amora Village	19.09.2024	52.6	48.7	45.0	49.7	50.5	42.8	48.2
N21	Arasmata Village	21.09.2024	55.0	51.1	47.4	52.1	52.9	43.4	50.1

7.2.3.1 Observations

a) Day time Noise Levels (L_{day})

Residential Area

The daytime (L_{day}) noise levels are observed to be in the range of 52.9 dB (A) – 48.7 dB (A), which are within the prescribed limit of 55 dB (A).

b) Night time Noise Levels (L_{night})

Residential Area

The nighttime (L_{night}) noise levels were observed to be in the range of 43.4 dB (A) – 41.5 dB (A), which are within the prescribed limit of 45 dB (A).

7.3 Ground Water Quality

Four ground water samples were collected around Ash pond area and four ground water samples were collected at villages around the plant site and analyzed for various parameters. The analytical results are presented below in **Table-14** and **Table-15**.

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TABLE-14
GROUND WATER QUALITY AROUND ASHPOND

Sr. No	Parameter	Units	GW1	GW2	GW3	GW4	
	Sampling season		Monsoon Season				
	Sampling date		12.09.2024	12.09.2024	12.09.2024	12.09.2024	
	Date of analysis		14.09.2024	14.09.2024	14.09.2024	14.09.2024	
1	pH	--	7.48	7.02	7.31	7.13	6.5 – 8.5 (NR)
2	Color	Hazen	7	11	8	10	5(15)
3	Taste	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Odour	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Conductivity	µs/cm	654	954	744	1278	\$
6	Turbidity	NTU	4	5	4	4	1(5)
7	Total Dissolved Solids	mg/l	418	629	485	844	500(2000)
8	Total Hardness as CaCO ₃	mg/l	186	291	216	399	200(600)
9	Total Alkalinity as CaCO ₃	mg/l	132.4	185.2	138.4	275.0	200(600)
10	Calcium as Ca ²⁺	mg/l	44.3	58.3	50.2	85.2	75(200)
11	Magnesium as Mg ²⁺	mg/l	18.3	35.3	22.1	45.2	30(100)
12	Residual Chlorine	mg/l	<0.2	<0.2	<0.2	<0.2	0.2(1)
13	Boron as B	mg/l	0.5	0.7	0.4	0.6	0.5(1)
14	Chloride as Cl ⁻	mg/l	98.3	150.2	121.2	176.3	250(1000)
15	Sulphate as SO ₄ ²⁺	mg/l	38.4	63.2	48.3	98.3	200(400)
16	Fluorides as F	mg/l	1.1	0.8	1.3	0.9	1.0(1.5)
17	Nitrate as NO ₃	mg/l	15.2	12.3	10.3	11.5	45(NR)
18	Sodium as Na ⁺	mg/l	59.2	75.0	67.3	100.2	\$
19	Potassium as K ⁺	mg/l	9.5	12.8	7.3	17.3	\$
20	Phenolic Compounds	mg/l	<0.001	<0.001	<0.001	<0.001	0.001(0.002)
21	Cyanides as CN	mg/l	<0.02	<0.02	<0.02	<0.02	0.05 (NR)
22	Anionic Detergents	mg/l	<0.1	<0.1	<0.1	<0.1	0.2 (1.0)
23	Mineral Oil	mg/l	<0.01	<0.01	<0.01	<0.01	0.5 (NR)
24	Cadmium as Cd	mg/l	<0.001	<0.001	<0.001	<0.001	0.003 (NR)
25	Total Arsenic as As	mg/l	<0.01	<0.01	<0.01	<0.01	0.01 (0.05)
26	Copper as Cu	mg/l	<0.01	<0.01	<0.01	<0.01	0.05 (1.5)
27	Lead as Pb	mg/l	<0.01	<0.01	<0.01	<0.01	0.01 (NR)
28	Manganese as Mn	mg/l	<0.01	<0.01	<0.01	<0.01	0.1 (0.3)
29	Iron as Fe	mg/l	0.03	0.05	0.04	0.08	0.3(NR)
30	Total Chromium (as Cr)	mg/l	<0.05	<0.05	<0.05	<0.05	0.05(NR)
31	Selenium as Se	mg/l	<0.01	<0.01	<0.01	<0.01	0.01(NR)
32	Zinc as Zn	mg/l	0.31	0.22	0.36	0.28	5(15)
33	Aluminium as Al	mg/l	<0.01	<0.01	<0.01	<0.01	0.03(0.2)
34	Mercury as Hg	mg/l	<0.001	<0.001	<0.001	<0.001	0.001(NR)
35	Pesticides	mg/l	Absent	Absent	Absent	Absent	Absent
36	E. Coli	--	Absent	Absent	Absent	Absent	Absent
37	Total Coliforms	MPN/100ml	Absent	Absent	Absent	Absent	10

Note: \$ - Limits not specified; NR - No Relaxation Limits are shown in IS 10500 are Acceptable limits (Requirement) and in parenthesis are Permissible limit in absence of alternate source

Sampling Locations

GW1. Ash pond Location-1, GW2. Ash pond Location-2, GW3. Ash pond Location-3, GW4. Ash pond Location-4

7.3.1 Observations

7.3.2.1 Ground Water Quality

The analysis results indicate that the pH and conductivity of the ground water was found to be in the range of 7.02– 7.48 and 654 to 1278 µS/cm. The Total Dissolved Solids were found to be well within the limits ranging from 418 to 844 mg/L Other parameters like Chlorides, Sulphates, Nitrates and Fluorides were observed to be well within the prescribed limits. The overall physico-chemical analysis of all the parameters is well within the standards as per IS: 10500.

TABLE-15
GROUND WATER QUALITY IN STUDY AREA

Sr. No	Parameter	Units	GW1	GW2	GW3	GW4	Limits as per IS:10500
	Sampling season		Monsoon Season				
	Sampling date		11.09.2024	11.09.2024	11.09.2024	11.09.2024	
	Date of analysis		13.09.2024	13.09.2024	13.09.2024	13.09.2024	
1	pH	--	7.27	7.16	7.47	7.51	6.5 – 8.5 (NR)
2	Color	Hazen	<1.0	<1.0	<1.0	<1.0	5(15)
3	Taste	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Odour	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Conductivity	µs/cm	685	906	885	976	\$
6	Turbidity	NTU	<1.0	<1.0	<1.0	<1.0	1(5)
7	Total Dissolved Solids	mg/l	432	579	575	635	500(2000)
8	Total Hardness as CaCO ₃	mg/l	236	286	265	301	200(600)
9	Total Alkalinity as CaCO ₃	mg/l	143.2	169.2	212.3	231.2	200(600)
10	Calcium as Ca ²⁺	mg/l	57.2	59.3	56.4	62.1	75(200)
11	Magnesium as Mg ²⁺	mg/l	22.5	33.4	30.2	35.3	30(100)
12	Residual Chlorine	mg/l	<0.2	<0.2	<0.2	<0.2	0.2(1)
13	Boron as B	mg/l	0.06	0.03	0.05	0.07	0.5(1)
14	Chloride as Cl ⁻	mg/l	106.0	148.1	116.2	131.0	250(1000)
15	Sulphate as SO ₄ ²⁺	mg/l	38.4	62.2	52.3	60.2	200(400)
16	Fluorides as F	mg/l	0.5	0.7	0.6	0.3	1.0(1.5)
17	Nitrate as NO ₃	mg/l	10.2	9.3	11.2	8.8	45(NR)
18	Sodium as Na ⁺	mg/l	44.5	71.2	76.3	82.3	\$
19	Potassium as K ⁺	mg/l	8.2	9.7	8.4	6.4	\$
20	Phenolic Compounds	mg/l	<0.001	<0.001	<0.001	<0.001	0.001(0.002)
21	Cyanides as CN	mg/l	<0.02	<0.02	<0.02	<0.02	0.05 (NR)
22	Anionic Detergents	mg/l	<0.1	<0.1	<0.1	<0.1	0.2 (1.0)
23	Mineral Oil	mg/l	<0.01	<0.01	<0.01	<0.01	0.5 (NR)
24	Cadmium as Cd	mg/l	<0.001	<0.001	<0.001	<0.001	0.003 (NR)
25	Total Arsenic as As	mg/l	<0.01	<0.01	<0.01	<0.01	0.01 (0.05)
26	Copper as Cu	mg/l	<0.01	<0.01	<0.01	<0.01	0.05 (1.5)
27	Lead as Pb	mg/l	<0.01	<0.01	<0.01	<0.01	0.01 (NR)
28	Manganese as Mn	mg/l	<0.01	<0.01	<0.01	<0.01	0.1 (0.3)
29	Iron as Fe	mg/l	0.04	0.05	0.07	0.06	0.3(NR)
30	Total Chromium (as Cr)	mg/l	<0.05	<0.05	<0.05	<0.05	0.05(NR)
31	Selenium as Se	mg/l	<0.01	<0.01	<0.01	<0.01	0.01(NR)
32	Zinc as Zn	mg/l	0.19	0.23	0.16	0.27	5(15)
33	Aluminium as Al	mg/l	<0.01	<0.01	<0.01	<0.01	0.03(0.2)
34	Mercury as Hg	mg/l	<0.001	<0.001	<0.001	<0.001	0.001(NR)
35	Pesticides	mg/l	Absent	Absent	Absent	Absent	Absent
36	E. Coli	--	Absent	Absent	Absent	Absent	Absent
37	Total Coliforms	MPN/100ml	Absent	Absent	Absent	Absent	10

Note: \$ - Limits not specified; NR - No Relaxation Limits are shown in IS 10500 are Acceptable limits (Requirement) and in parenthesis are Permissible limit in absence of alternate source

Sampling Locations

GW1. Amora Village (Bore well) , GW2. Rogda (Bore well)
GW3. Banahill (Bore well) , GW4. Nariyara Village (Bore well)

7.3.1 Observations

7.3.2.1 Ground Water Quality

The analysis results indicate that the pH and conductivity of the ground water was found to be in the range of 7.16 - 7.51 and 685 to 976 µS/cm. The Total Dissolved Solids were found to be well within the limits ranging from 432 to 635 mg/L. Other parameters like Chlorides, Sulphates, Nitrates and Fluorides were observed to be well within the prescribed limits. The overall physico-chemical analysis of all the parameters is well within the standards as per IS: 10500.

7.4 Waste Water Quality

Four waste water samples were collected within the plant site and analyzed for various parameters. The analytical results are presented below in **Table-16**.

TABLE-16
WASTE WATER QUALITY

Sr. No.	Parameters	Units	CT Blow Down	Boiler Blow Down	Condenser Cooling water	Guard Pond	Limits as per CECB& CPCB
			WW1	WW2	WW3	WW4	
	Sampling Date		12.09.2024	12.09.2024	12.09.2024	12.09.2024	
	Date of Analysis		14.09.2024	14.09.2024	14.09.2024	14.09.2024	
1	p ^H	-	7.75	8.31	8.17	7.87	6.5-8.5
	Temperature	°C	27.0	28.3	28.8	27.3	
3	Total Dissolved Solids	mg/l	393	10	7	438	-
4	Total Suspended Solids	mg/l	23.2	<1.0	<1.0	55.8	100
5	Dissolved Oxygen	mg/l	5.3	5.0	5.2	5.4	-
6	Biochemical Oxygen Demand, (3 days at 27°C)	mg/l	<3	<3	<3	<3	-
7	Chemical Oxygen Demand	mg/l	<5	<5	<5	54	-
8	Chlorides	mg/l	54.1	22.5	19.2	108.3	-
9	Sulphates	mg/l	66.3	26.1	29.3	93.5	-
10	Phosphates	mg/l	0.28	<0.01	<0.01	1.56	5.0
11	Zinc	mg/l	<0.01	<0.01	<0.01	0.31	1.0
12	Chromium	mg/l	<0.01	<0.01	<0.01	<0.01	0.2
13	Copper	mg/l	<0.01	<0.01	<0.01	<0.01	1.0
14	Free Available chlorine	mg/l	<0.2	<0.2	<0.2	<0.2	0.5
15	Irons	mg/l	<0.01	<0.01	<0.01	0.16	1.0
16	Oil & Grease	mg/l	<1.0	<1.0	<1.0	<1.0	20

7.4.1 Results and Conclusions

The data analysis to be as per CFO Norms and analytical results indicated that the guard pond waste water is well within the standard limits specified by EPA Notification [G.S.R.7, dt. Dec.22,1998].

7.4.2 Observations-Waste water quality.

The analysis results indicate that the pH ranges from 7.75 – 8.31 and the Total Suspended Solids were found to be within the limits ranging from <1.0-55.8 mg/l. Other parameters like Zinc, Chromium, Available, chloride, Iron and Oil& Grease were observed to be well within the prescribed limits.

	Monthly Environmental Monitoring Report for 6x600 MW Coal Based Power Plant of KSK Mahanadi Power Company Limited at Nariyara Village, Janjgir-Champa District, Chhattisgarh September 2024
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7.4.3 Sewage Waste Water Quality

One Sewage water samples is collected and analyzed for various parameters. The survey analytical results are given in **Table-17**.

TABLE-17
SEWAGE WASTE WATER QUALITY

Sr.No	Parameter	UOM	WW5 (STP Outlet)
	Sampling Date		12.09.2024
	Date of Analysis		14.09.2024
1	pH	-	7.84
2	Total Dissolved Solids	mg/l	448
3	Total Suspended Solids	mg/l	23.8
4	Dissolved Oxygen	mg/l	5.1
5	Bio Chemical Oxygen Demand for 3 day 27°C	mg/l	<1.0
6	Chemical Oxygen Demand	mg/l	28
7	Chlorides	mg/l	92.1
8	Sulphates	mg/l	134.1
9	Phosphates	mg/l	0.42
10	Zinc	mg/l	0.38
11	Chromium	mg/l	<0.01
12	Copper	mg/l	<0.01
13	Available Chlorine	mg/l	<0.2
14	Iron	mg/l	0.22
15	Oil and Grease	mg/l	<1.0

7.5 Water Depth measurement

Four ground water depths at villages and plant and four ash pond area locations were measured and results are given in **Table-18**.

TABLE-18
WATER DEPTH MEASUREMENT

Location Code	Location Name	Depth(m)
BW1	Banahil Village	2.13
OW1	Nariyara Village	1.28
OW2	Amora Village	1.33
OW3	Rogda Village	1.68
ASH1	Ash pond Location-1	5.22
ASH2	Ash pond Location-2	4.28
ASH3	Ash pond Location-3	6.36
ASH4	Ash pond Location-4	1.30

7.6 Stack Emission Monitoring

The power plant has stack of height 275.0-m, which is the major source of air pollution. The stack emission monitoring for Unit – II, Unit - III & Unit - IV has been carried out and results are given in **Table-19 to 21**.

TABLE19
STACK EMISSION MONITORING UNIT -II

Sr. No.	Parameters	UOM	Result	Methods
Date Of Sampling :26/09/2024				
Sampling Time : 11.30 to 12.30 hrs				
Duration Of sampling : 60 mints				
Date of sample analysis : 28/09/2024				
Details of the source				
1	Capacity	MW	600	-
2	Stack Height	M	275	-
3	Duct Dimension	M	7.0	-
4	Duct area	m ²	38	-
Flue Gas Characteristics				
5	Temperature	°C	127	USEPA 1,2,3&4
6	Velocity	m/s	23.04	USEPA 1,2,3&4
7	Volumetric Flow Rate	Nm ³ /s	648.25	USEPA 1,2,3&4
8	Particulate Matter	mg/Nm ³	24.56	USEPA 5
9	Sulfur dioxide	mg/Nm ³	904	USEPA 6
10	Oxides of Nitrogen	mg/Nm ³	365	USEPA 7
11	Arsenic as As	mg/Nm ³	0.016	USEPA method -29
12	Cadmium as Cd	mg/Nm ³	0.020	USEPA method -29
13	Cobalt as Co	mg/Nm ³	<0.001	USEPA method -29
14	Nickel as Ni	mg/Nm ³	0.022	USEPA method -29
15	Copper as Cu	mg/Nm ³	0.041	USEPA method -29
16	Mercury as Hg	mg/Nm ³	0.011	USEPA method -29
17	Chromium as Cr	mg/Nm ³	0.034	USEPA method -29
18	Manganese as Mn	mg/Nm ³	0.042	USEPA method -29
19	Antimony as Sb	mg/Nm ³	<0.001	USEPA method -29
20	Lead as Pb	mg/Nm ³	0.036	USEPA method -29
21	Thallium as TI	mg/Nm ³	<0.001	USEPA method -29
22	Vanadium as V	mg/Nm ³	<0.001	USEPA method -29

The results indicate that the PM is observed as 24.56 mg/Nm³.

 KSK Power from knowledge	Monthly Environmental Monitoring Report for 6x600 MW Coal Based Power Plant of KSK Mahanadi Power Company Limited at Nariyara Village, Janjgir-Champa District, Chhattisgarh <p style="text-align: right;">September 2024</p>
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TABLE-20
STACK EMISSION MONITORING UNIT -III

Sr. No.	Parameters	UOM	Result	Methods
Date Of Sampling : 16/09/2024				
Sampling Time : 11.00 to 12.00 hrs				
Duration Of sampling : 60 mints				
Date of sample analysis : 18/09/2024				
Details of the source				
1	Capacity	MW	600	-
2	Stack Height	M	275	-
3	Duct Dimension	M	7.0	-
4	Duct area	m ²	38	-
Flue Gas Characteristics				
5	Temperature	°C	120	USEPA 1,2,3&4
6	Velocity	m/s	22.76	USEPA 1,2,3&4
7	Volumetric Flow Rate	Nm ³ /s	630.50	USEPA 1,2,3&4
8	Particulate Matter	mg/Nm ³	9.01	USEPA 5
9	Sulfur dioxide	mg/Nm ³	831	USEPA 6
10	Oxides of Nitrogen	mg/Nm ³	390	USEPA 7
11	Arsenic as As	mg/Nm ³	0.022	USEPA method -29
12	Cadmium as Cd	mg/Nm ³	0.014	USEPA method -29
13	Cobalt as Co	mg/Nm ³	<0.001	USEPA method -29
14	Nickel as Ni	mg/Nm ³	0.033	USEPA method -29
15	Copper as Cu	mg/Nm ³	0.038	USEPA method -29
16	Mercury as Hg	mg/Nm ³	0.007	USEPA method -29
17	Chromium as Cr	mg/Nm ³	0.029	USEPA method -29
18	Manganese as Mn	mg/Nm ³	0.035	USEPA method -29
19	Antimony as Sb	mg/Nm ³	<0.001	USEPA method -29
20	Lead as Pb	mg/Nm ³	0.026	USEPA method -29
21	Thallium as TI	mg/Nm ³	<0.001	USEPA method -29
22	Vanadium as V	mg/Nm ³	<0.001	USEPA method -29

The results indicate that the PM is observed as 9.01 mg/Nm³.

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TABLE-21
STACK EMISSION MONITORING UNIT -IV

Sr. No.	Parameters	UOM	Result	Methods
Date Of Sampling : 16/09/2024				
Sampling Time : 15.00 to 16.00 hrs				
Duration Of sampling : 60 mints				
Date of sample analysis : 18/09/2024				
Details of the source				
1	Capacity	MW	600	-
2	Stack Height	M	275	-
3	Duct Dimension	M	7.0	-
4	Duct area	m ²	38	-
Flue Gas Characteristics				
5	Temperature	°C	109	USEPA 1,2,3&4
6	Velocity	m/s	22.31	USEPA 1,2,3&4
7	Volumetric Flow Rate	Nm ³ /s	646.37	USEPA 1,2,3&4
8	Particulate Matter	mg/Nm ³	14.68	USEPA 5
9	Sulfur dioxide	mg/Nm ³	866	USEPA 6
10	Oxides of Nitrogen	mg/Nm ³	402	USEPA 7
11	Arsenic as As	mg/Nm ³	0.028	USEPA method -29
12	Cadmium as Cd	mg/Nm ³	0.017	USEPA method -29
13	Cobalt as Co	mg/Nm ³	<0.001	USEPA method -29
14	Nickel as Ni	mg/Nm ³	0025	USEPA method -29
15	Copper as Cu	mg/Nm ³	0.037	USEPA method -29
16	Mercury as Hg	mg/Nm ³	0.010	USEPA method -29
17	Chromium as Cr	mg/Nm ³	0.024	USEPA method -29
18	Manganese as Mn	mg/Nm ³	0.038	USEPA method -29
19	Antimony as Sb	mg/Nm ³	<0.001	USEPA method -29
20	Lead as Pb	mg/Nm ³	0.026	USEPA method -29
21	Thallium as TI	mg/Nm ³	<0.001	USEPA method -29
22	Vanadium as V	mg/Nm ³	<0.001	USEPA method -29

The results indicate that the PM is observed as 14.68 mg/Nm³.

ANNEXURE-X

FGD SYSTEM-PLANT LAYOUT WITH ABSORBER UNITS



ANNEXURE - XI

Photographs of Dust Extraction Systems installed in Coal & Ash Handling Areas, KMPCL



Bag filters installed above Silo



List of DE, DSS & DFS systems installed in CHP Area

Location	Type of Pollution Control Devices	Quantity in Nos.
DE SYSTEM		
C-1E/F	Dust extraction system	1
C-2A/B	Dust extraction system	2
C-3A/B	Dust extraction system	2
C-12	Dust extraction system	1
C-4A/B	Dust extraction system	2
C-13	Dust extraction system	1
C-5A/B	Dust extraction system	2
C-6A/B	Dust extraction system	2
C-7A/B	Dust extraction system	2
C-8A/B	Dust extraction system	2
C-10A/B	Dust extraction system	2
C-11A/B	Dust extraction system	2
BUNKER #3	Dust extraction system	7
BUNKER #4	Dust extraction system	7
Total		35
DSS SYSTEM		
C-2A	Dust suppression system	5
C-2B	Dust suppression system	3
C-3A	Dust suppression system	5
C-3B	Dust suppression system	5
C-8A	Dust suppression system	4
C-8B	Dust suppression system	4
PTL (WT-1)	Dust suppression system	30
PTL (WT-2)	Dust suppression system	30
HOPPER (WT-1)	Dust suppression system	42
HOPPER (WT-2)	Dust suppression system	44
Total		172
DFS		
C-1E	Dry fog system	6
C-1F	Dry fog system	6
APRON FEEDER -1	Dry fog system	8
APRON FEEDER -2	Dry fog system	8
Total		28
YARD SPRINKLER SYSTEM		
YARD-1	Sprinkler system	11
YARD-2	Sprinkler system	11
YARD-3	Sprinkler system	11
YARD-4	Sprinkler system	11
Total		44

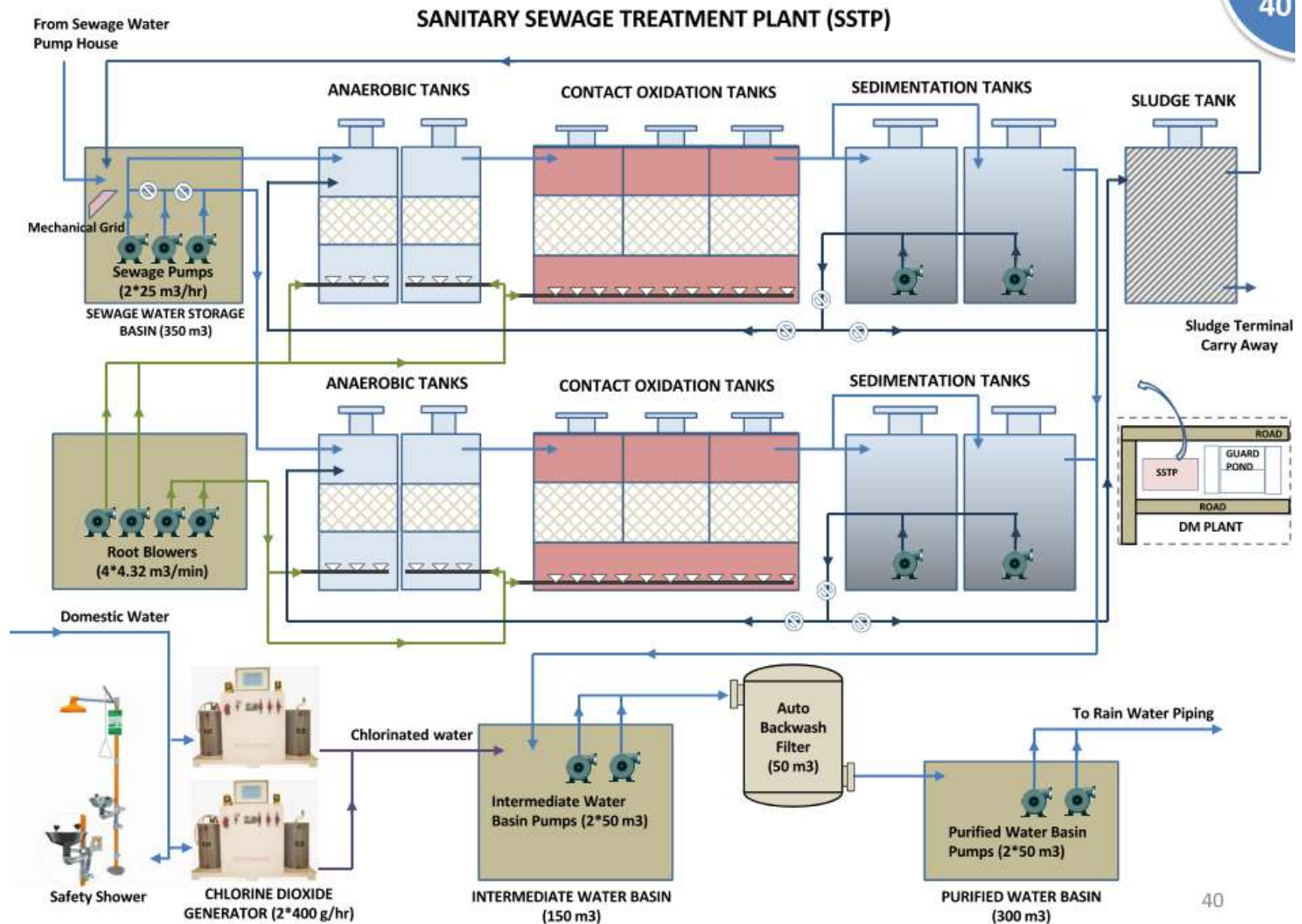
ANNEXURE - XII

Photographs for Sewage Treatment Plant installed in KMPCL



SEWAGE TREATMENT PLANT-(6x600MW)

40



ANNEXURE - XIII

Photographs of Rain Water Harvesting measures implemented In Kmpcl

1. Large Rain Water Harvesting Structure (Reservoir-3):

- a) Capacity= 06 Lakh CUM
- b) Pond Dimension (Lenth x Width x Depth) mtr= 294.8m x 267.7m x 8m
- c) Co-ordinates points= 21°57'48" N
 82°23'51" E



Sattelite Map Showing Rain Water Harvesting Structure in KMPCL



2) Recharge Wells constructed in different location of plant premises:



Figure 1: Recharge Well No. 1



Figure 2: Recharge Well No. 2



Figure 3: Recharge Well No.3



Figure 4: Recharge Well No.4

Storm water collection well for recharge the ground



Annual Runoff Calculations:

Annual Run off Calculations				
Catchment	Area (Sq.Mtrs)	Run-Off Coeff.	Av. Annual Rainfall(mm)	Total Run off per annum (KL)
Total Road area	131753	0.9	1157	137194.3989
Other Open area	1948247	0.6	1157	1352473.067
Total Site area	2080000			1489667.466

RECHARGE WELL CALCULATIONS

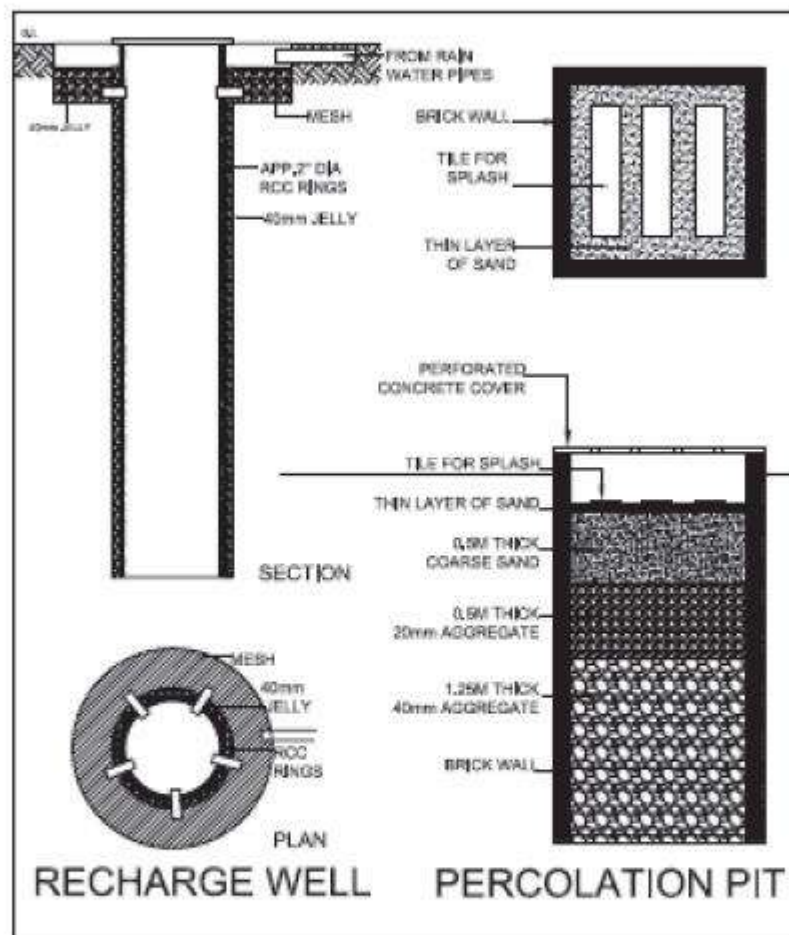
Volume of one recharge well:

Description	Qty	units
Diameter	1.5	m
Radius	0.75	m
Depth	6	m
Volume	10.59	cubic meters

Total of 147 recharge wells with a combined volume of 1579.027 cubic meters Over and above this, we can assume a 30% recharge rate.

This means that even while the well is filling up with rainwater, at the same time recharge is happening. Therefore the effective capacity will be 30% more

Effective recharge capacity- 2052.735 cubic meters



The recharge well and a percolation pit

ANNEXURE - XIV

1. Fire Lines facilitate at Coal Yards



2. Full-fledged Fire Tenders available at site:





ANNEXURE - XV

DIRECTORATE, INDUSTRIAL HEALTH & SAFETY, RAIPUR (C.G.)

Block-III, 2nd Floor, Indravati Bhawan, Naya Raipur (C.G.)

e-mail - dihscg@gmail.com

Ph. No. - 0771-2442360

Application No. : 803272

Raipur, dated : 23/07/2024

To,

The Occupier,

KSK MAHANADI pOWER COMPANY LIMITED

Near Nariyara Village Tehsil Akaltara Janjgir - Champa 495553

Sub :- ON-SITE EMERGENCY PLAN.

Ref :- Your documents on the subject dated 15/04/2024

Please be informed that documents (placed below containing pages (229 duly verified by the occupier) in which the occupier has disclosed the information related to hazards at his installation in compliance of the section 41-B of the factories Act, 1948 and which also describes his On-Site Emergency Plan (After supplementing certain modification by the MAHC Cell distinctively marked on the plan) is hereby notified final with the following stipulations :-

(i) That in the case any relevant information as required under the section 41-B of the Factories Act, 1948, If has not been disclosed this notification does not provide any exemptin in this regard and the occupier himself is liable for concealing the information.

(ii) That the documents will be subjected for review :-

(a) Generally after a period of two years from the date of issue of this order.

(b) During any intervening period of two years if it is instructed to do so by this cell.

OR

(c) Invariably, when any change in the plant, machinery, Building, Structure, substance, storage or the manufacturing processes/operations is intended by the occupier or his factory persons;

(iii) That the documents will have to be reviewed (as above) always in consultation with this cell and it will be occupier's liability to provide reasonable time for review and get notified final for further period;

(iv) That suitable training/mock-drill/exercise be arranged at the factory to make all concerned familiar with their duties/responsibilities as outlined in the on-site emergency and be well trained to act accordingly at any emergency and save lives as well as the property:

(v) That reports/ observation of mock-drills/rehearsal or action at any emergency situation that might have arisen, shall be furnished by the factory management to this cell to assess efficiency of the plan.

(vi) The necessary copies of this plan or part thereof be got multiplied by the factory management and provide to all concerning statutory authorities and other persons and also placed at designated emergency control centre in an accessible place to all concerned in the factory.

(vii) That in case of failure to comply with the stipulations or the relevant provisions of the law, not with standing legal proceeding to which the occupier may be subjected, he himself will bear (for any suspension/refusal rejection of his licence to work the factory) the liability of such action.

Encl.:- As above

Alarmelm
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Date: 2024.07.23
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Chief Inspector of Factories
Govt.of C.G. Raipur

ANNEXURE - XVI

अध्यक्ष

4153

सीजन्य ः ठेकेदार सयशः वि

बिलासपुर

कावेलिय नगर पंचायत बोदरी, जिला

॥ निविद्धासंयुक्त सधना ॥

[illegible]

क्र.	विषय	अनुमति प्राप्त/अनुमति न	अवधि
1	बस स्टैंड के निर्माण के लिए	अनुमति प्राप्त	20/05/2018
2	बस स्टैंड के निर्माण के लिए	अनुमति प्राप्त	20/05/2018
3	बस स्टैंड के निर्माण के लिए	अनुमति प्राप्त	20/05/2018
4	बस स्टैंड के निर्माण के लिए	अनुमति प्राप्त	20/05/2018
5	बस स्टैंड के निर्माण के लिए	अनुमति प्राप्त	20/05/2018
6	बस स्टैंड के निर्माण के लिए	अनुमति प्राप्त	20/05/2018
7	बस स्टैंड के निर्माण के लिए	अनुमति प्राप्त	20/05/2018
8	बस स्टैंड के निर्माण के लिए	अनुमति प्राप्त	20/05/2018
9	बस स्टैंड के निर्माण के लिए	अनुमति प्राप्त	20/05/2018
10	बस स्टैंड के निर्माण के लिए	अनुमति प्राप्त	20/05/2018

निम्नलिखित बातें ध्यानपूर्वक पढ़ें।

ਸ੍ਰੀ ਮਾਤਾ ਜੀ
ਸ਼੍ਰੀ ਮਾਤਾ ਜੀ

ANNEXURE - XVII

ENV.KMPCL

From: ENV.KMPCL
Sent: 27 June 2024 12:21
To: 'ecompliance-cg@gov.in'
Cc: 'Head Office CECB'; 'Robilaspur Bsp'
Subject: Submission of Six Monthly EC Compliance Report for the period October 2023 to March 2024 for M/s KSK Mahanadi Power Company Ltd. (6x600MW TPP) at Village-Nariyara, Akaltara, CG.- Reg.

Dear Sir,

Greetings from M/s KSK Mahanadi Power Company Limited.

With reference to the above subject, we are submitting herewith following link pertaining soft copy of Half yearly compliance report for the period **October-2023** to **March-2024** in respect of the conditions stipulated in the Environmental Clearance granted to M/s KSK Mahanadi Power Company Limited.; for your kind perusal and necessary records pl.

 KMPCL-Six Monthly EC Compl Report-Oct'23 to Mar'24-22.06.2024.pdf

Thanking you,
Your's sincerely

**Environment Division,
M/s KSK Mahanadi Power Company Ltd.,
Village-Nariyara, Akaltara,
Chhattisgarh.**

**KSK Mahanadi Power Company Limited**

CIN No. : U40300TG2009PLC064062

Works

Near Nariyara Village,
Akaltara Tehsil,
Janjgir - Champa District,
Chhattisgarh Pin : 495553
Tel (Site): 07817-284001

Registered Office

8-2-293/82/A/431/A,
Road No. 22 Jubilee Hills
Hyderabad - 500033,
Tel: +91-40-23559922-25
Tel: +91-40-23558701
Fax: +91-40235530

Ref.: MoEF&CC,RPUR/BPSN/2500108/493**Date: 1st Jun 2024**

To
Integrated Regional officer,
Ministry of Environment, Forests & Climate Change
Aranya Bhavan North Block, Sector-19
Naya Raipur, Atalnagar
Chhattisgarh, PIN: 492002

Sub: -Six Monthly Status of Compliance for Environmental Clearance granted to M/s KSK Mahanadi Power Company Limited (6x600 MW Coal Based Thermal Power Project) located at village- Nariyara, Tehsil- Akaltara, District-Janjgir, Champa, Chhattisgarh-Reg.

Ref: - i) Ministry's Letter No. - J13012/44/08 -IA.II (T), Dt. 19.10.2009
ii) Re-validation Letter No. - J-13012/44/2008-IA.II (T), Dt. 19.04.2018.

Sir,

With reference to the above subject and cited references, please find the enclosed Half yearly compliance report for the period **October-2023** to **March-2024** in respect of the conditions stipulated in the environmental clearance granted to M/s KSK Mahanadi Power Company Limited.

For favour of your kind information and perusal please.

Thanking You.

Your's sincerely,
For **KSK Mahanadi Power company Limited**

Dr.M.V.R.N Acharyulu
(Authorized Signatory)

Encl: Six Monthly Environmental Clearance Compliance Report- **Oct'23** to **Mar'24**.

Copy to: (1) The Member Secretary, CECB, Atal Nagar, Raipur, Chhattisgarh.

(2) The Regional Officer, CECB, Bilaspur, Chhattisgarh.

Annexure-XVIII

ENV.KMPCL

From: ENV.KMPCL
Sent: 19 September 2024 17:26
To: 'Robilaspur Bsp'
Cc: 'Head Office CECB'
Subject: Submission of Environmental Statement Report (Form-V) for FY2023-24 for M/s KSK Mahanadi Power Company Limited, Village-Nariyara, Akaltara-Reg.
Attachments: Environmental Statement Report (Form-V)-FY2023-24-KMPCL.pdf

Dear Sir,

Greetings from M/s KSK Mahanadi Power, Nariyara.

With reference to the Consent for Operation and Environmental Clearance obtained to M/s KSK Mahanadi Power Company Ltd., Nariyara, Akaltara, CG., please find herewith the attached Environmental Statement Report (Form-V) for FY2023-24, for your kind acknowledgement and necessary record please.

Thanking you,
You's sincerely

Environment Dept.
KSK Mahanadi Power Company Ltd.,
Village-Nariyara, Akaltara, CG.

**KSK Mahanadi Power Company Limited**

CIN No. : U40300TG2009PLC064062

Works

Near Nariyara Village,
Akaltara Tehsil,
Janjgir - Champa District,
Chhattisgarh Pin : 495553
Tel (Site): 07817-284001

Registered Office

8-2-293/82/A/431/A,
Road No. 22 Jubilee Hills
Hyderabad - 500033,
Tel: +91-40-23559922-25
Tel: +91-40-23558701
Fax: +91-40235530

Ref. No: CECB, BILAS/BPSN/2500108/732**Date: 10.09.2024**

To
The Regional Officer,
Chhattisgarh Environment Conservation Board,
Vyapar Vihar, Near Pt. Deendayal Upadhyaya Park,
Bilaspur, Chhattisgarh.

Sub: - Submission of Environmental Statement (**Form-V**) for the Financial Year **2023-24**-Reg.

Ref: -i) Renewal Consent for Operation No.903 /TS/CECB/2024 Nava Raipur Atal Nagar, Dtd. 29/04/2024.
ii) Environmental Clearance No. (Amendment & Extended of Validity)- J-13012/44/2008-IA.II (T),
Dt.19.10.2009 & J-13012/44/2008-IA.II (T) GoI. MoEF &CC, New Delhi, Dt.19.04.2018.
iii) Rule-14 of Environmental (Protection) Rule, 1986

Sir,

In inviting references to the above subject and cited references, please find enclosed herewith Environmental Statement in **Form-V** for M/s KSK Mahanadi Power Company Limited (3x600MW-Operational Units). Village-Nariyara, Akaltara, Chhattisgarh for the Financial Year **2023-24** along with relevant enclosures.

Submitted for your kind perusal and record please.

Thanking You,

Yours faithfully,

For **KSK Mahanadi Power company Limited**

Dr. M.V.R.N Acharyulu
(Authorized Signatory)

Encl: Environmental Statement (Form-V) for **FY 2023-24**.

Copy to: The Member Secretary, Paryavas Bhavan, North Block Sector-19, Atal Nagar Dist- Raipur (C.G.)-492002.



ENVIRONMENTAL STATEMENT REPORT

[FORM – V]

**KSK Mahanadi Power Company Limited,
Village- Nariyara, Tehsil- Akaltara
District- Janjgir-Champa
Chhattisgarh.**

Running Units No. 3, 4 & 2 (3x600MW)

The Financial Year-FY2023-24

**Submitted to
Chhattisgarh Environment Conservation
Board, Chhattisgarh**



FORM - V
(See Rule 14)

Environmental Statement Report for the financial year ending the 31st March, 2024.

PART-A

- (i) Name and address of the : Mr. S. Kishore, Director
Owner/Occupier of the Industry, M/s KSK Mahanadi Power Company Limited
Operation or process. Village- Nariyara, Tehsil-Akaltara,
District- Janjgir-Champa, Chhattisgarh
- (ii) Industry Category : Red A Category
- (iii) Production capacity : 3x600 MW
- (iv) Year of Establishment : 16th Feb 2010
Commercial Operation Date 14th Aug 2013 (for **Unit No. #3**)
26th Aug 2014 (for **Unit No. #4**)
28th Feb 2018 (for **Unit No. #2**)
- (v) Date of the last environmental : 12th September, 2023
Audit Report submitted

PART-B

Water and Raw Material Consumption

i) Water Consumption:

Raw Water	During the previous financial Year 2022-23	During the Financial Year 2023-24
For production of DM plant water (m3)	0	0
For cooling water & miscellaneous (m3)	23505663	24273843
Potable water (m3)	160094	204902
Total	23665757	24478745

Name of the product:	Water consumption per unit of product	
Specific water consumption (KL/MWH)	During the previous FY 2022-23	During the FY 2023-24
	2.25	2.28
		Details enclosed as Annexure-I
Gross electricity generated (MU)	Electricity generation	
	During the previous Financial Year 2022-23	During the Financial Year 2023-24
	10522.34	10715.97
		Details enclosed as Annexure-II

ii) Raw Material consumption:

SL. No	Name of raw materials.	Name of products	Consumption of raw material per unit of output (kg/Kwh)	
			During the previous FY 2022-23	During the FY 2023-24
1	Coal	Electricity	0.65	0.65
2	LDO/ HFO (Only during start up) (ml/kwh)		0.15	0.19

(i) Pollutant	Quantity of Pollution Generated	Percentage of variation from Prescribed Standards
---------------	---------------------------------------	---

a) Waste Water

Condenser Cooling Water

Parameters	Limit	Range of conc.	% age of variation
pH	6.5- 8.5	7.9	within limits
Temp	Not more than 5°C higher than the intake	28.7	within limits
FA Chlorine	0.5 mg/L	<0.2	within limits

Boiler Blow Down

Parameters	Limit	Range of conc.	% age of variation
Suspended solid	100 mg/L	15.6	within limits
Oil & Grease	20 mg/L	<1.0	within limits
Copper	1 mg/L	<0.01	within limits
Iron	1 mg/L	<0.01	within limits

Cooling Tower Blow Down

Parameters	Limit	Range of conc.	% age of variation
FA Chlorine	0.5 mg/L	<0.2	within limits
Zinc	1.0 mg/L	0.05	within limits
Chromium (T)	0.2 mg/L	<0.01	within limits
Phosphate	5.0 mg/L	0.09	within limits

b) Air

Stack emission characteristics Unit#3		Quantity Kg/hour	Average concentration (mg/Nm3)	% Variation
Parameters	Limit			
Particulate Matter (PM)	50mg/Nm3	57.4	26.1	-47.9 %
Stack emission characteristics Unit#4		Quantity Kg/hour	Average concentration (mg/Nm3)	% Variation
Parameters	Limit			
Particulate Matter (PM)	50mg/Nm3	43.1	18.9	-62.2 %
Unit-2		Quantity Kg/hour	Average concentration (mg/Nm3)	% Variation
Parameters	Limit			
Particulate Matter (PM)	30mg/Nm3	59.6	25.6	-14.5 %

PART-D

Hazardous Wastes

(As specified under Hazardous Wastes (Management, Handling and Transboundary Movement Rules, 2008)

Hazardous Wastes	Total Quantity During the previous financial year (2022-23)	During the financial year (2023-24)
From Process	i) 12.38 MT (Used Oil) ii) 32 nos. (Empty Barrels)	i) 18.5 MT (Used Oil) ii) 95 nos. (Empty Barrels)
From Pollution Control Facility	Nil	Nil

PART-E

Solid Wastes

Sl. No.		Total Quantity	
		During the previous Financial year (2022-23)(MT)	During the current Financial year (2023-24)(MT)
a)	From process- Fly Ash (Generation Quantity)	2405591 MT	2455283 MT
b)	From Pollution Control facility	Nil	Nil
c)	(1) Quantity recycled or re- utilized within the Unit.	--	--
	(2) Sold	--	--
	(3) Disposed (including pond ash)	2466601 MT	2455283 MT

PART-F

Please specify the characteristics in terms of composition and quantum of Hazardous waste as well as solid wastes and indicate disposal practice adopted for both these categories of wastes.

Hazardous waste:

The generated used/spent oil is hydrocarbon in nature. **18.5 MT** of Used/spent oil (under Schedule-I, category No.-5.1) and **95 nos.** of Empty barrels (Schedule-I, Cat. No. 33.1) is disposed to authorized recycler of Hazardous Waste during this **FY 2023-24**.

Fly Ash and Bottom Ash:

At present, only Fly Ash & Bottom Ash as Solid Waste is being generated from power plant operation. Fly ash is being collected pneumatically and stored in silos of 2 x 3900m³ capacity. Then fly ash is being transferred through air tight telescopic chute to bulkers, which are used in cement and brick manufacturing industry. Bottom Ash disposed to Ash Pond/dyke in slurry form through Lean Slurry Disposal Systems and utilized in low lying/ abandoned stone quarry pits by scientific methods. Fly ash generated from plant operation is being utilized 100% by dispatching to Cement Industry, Brick Manufactures, Road Construction work, Low lying areas and abandoned stone quarry pits. Details of Fly ash generation and utilization in FY 2023-24 is enclosed in **Annexure- III**.

Data of Industrial Effluent

Annexure- IV

Monthly Source Emissions Unit # 3

Annexure- V

Monthly Source Emissions Unit # 4

Annexure- V (A)

Monthly Source Emissions Unit # 2

Annexure- V (B)

SUMMARY OF AMBIENT AIR QUALITY RESULTS (Inside Plant)

Annexure- VI

SUMMARY OF AMBIENT AIR QUALITY RESULTS (Outside Plant)

Annexure- VI (A)

PART-G

Impact of the pollution abatement measures taken on conservation of natural resources and on the cost of production:

1. Low Sulphur Coal is used for power generation: Enabling to lower the SO₂ – Emission.
2. For Coal transportation through Rail Mode- Merry go round track is being used. (i.e. minimize line source emissions & Fuel Conservation).
3. For Coal transportation through Road Mode: Tarpaulin covered trucks/dumpers has been followed-up to minimize Secondary /Tertiary fugitive dust emission.
4. Optimal Usage of Combustion support or Auxiliary fuels i.e LDO (lower per MW Liquid fuel cost)
5. Optimization of Coal Inventory level.
6. Reuse & recycle of waste water (Boiler, CT Blow down & DM Plant for ash handling purpose (Reducing demand for fresh raw water).
7. Fly Ash generated from Power Plant operation is being 100% utilized by dispatching to Cement Industry, Brick Manufactures, Road Construction work, Low lying areas and Mines quarry pits filling (Ash Dyke storage optimization)
8. Use of Low – NO_x Burner in furnace (Energy Conservation)
9. All major motor drives are equipped with variable frequency drive to save energy.
10. Dust extraction systems are provided & operation to minimize coal dust losses through fugitive dust emission.
11. Extensive tree planation has been carried out. As on date, total **7,20,000 nos.** of saplings have been planted within the Plant premises in an areas about **277** hectares i.e **33.3%** of total project area (**828.46** Hectares). Out of which **6,33,185 nos.** of saplings has been survived and further plantation by causality replacement is under progress.

PART-H

Additional measures investment proposal for environmental protection including abetment of pollution prevention of pollution.

Environmental Cost details towards pollution control and monitoring for the year 2023-24 are as follows:

Environmental Expenses in FY 2023-24

Section	Capital expenditure	Recurring expenditure	Total
	(In Crores)	(In Crores)	
Air quality Management	--	--	--
Electrical, mechanical, Civil spares	--	₹ 8.19	₹ 8.19
Manpower cost	--	₹ 0.79	₹ 0.79
Road Water Sprinkling	--	₹ 0.54	₹ 0.54
Energy consumption cost (ESP+FF)	--	₹ 3.08	₹ 3.08
Water quality and waste water quality Management	--	--	--
Chemicals	--	₹ 0.63	₹ 0.63

**Environmental Statement Report for 2023-24 of KSK Mahanadi Power Company Limited,
Operational Units No. - 3, 4 & 2 (3x600MW TPP)**

Maintenance & manpower cost	--	₹ 1.27	₹ 1.27
Solid waste Management	--	--	--
Ash Transportation and Manpower Cost	--	₹ 162.05	₹ 162.05
Annual maintenance of Ash dykes	--	₹ 0.06	₹ 0.06
Hazardous waste Management	--	--	--
Hazardous Waste Storage Shed	--	0	₹ 0.00
House Keeping	--	--	--
Manpower, Tools /Tackles & Vehicles resources cost.	--	₹ 8.21	₹ 8.21
Greenbelt Development	--	--	--
Equipment	--	₹ 0.40	₹ 0.40
Manpower cost	--	₹ 1.96	₹ 1.96
CSR Expenses		₹ 0.86	₹ 0.86
Environmental Monitoring (offline)	--	₹ 0.31	₹ 0.31
Environmental Monitoring (Online)	--	₹ 0.20	₹ 0.20
EMD Manpower cost	--	₹ 0.82	₹ 0.82
Total	₹ 0.00	₹ 189.36	₹ 189.36

PART-I
Miscellaneous

Any other particulars for improving environment protection and abatement of pollution.

1. High efficiency ESP + Hybrid Fabric Filter combination, with 99.7% efficiency has been installed for each Unit (600MW).
2. Zero water discharge system has been implemented. Effluents are being used in Ash Handling, Dust Suppression, DM water Production & Green belt development purposes.
3. Development of Greenbelt, ranging 50 to 100m width, by using Local Climate suitable Fast growing plant species.
4. Pulse Jet type bag -filters have been installed at all the Transfer-points meant for Coal transport from CHP area to boiler area.-
5. Water sprinkling arrangement facilitate at all the dust prone areas including Coal yard area.
6. 44 No's Rain Gun type of Water spray system has been installed at Coal yard area.
7. Installation of bag filters & Dry Fog System over the Coal conveyor Transfer Towers.
8. All the major internal roads are concretized and adequate capacity of water tankers has been deployed for water spraying to control fugitive dust emission.
9. Regular sweeping of roads are also in practiced.
10. Necklace drains provided in and around the Coal yard and other area to prevent leachate water.

WATER CONSUMPTION DETAILS IN FY2023-24						
Consumption of Raw Water (KL)				Reuse/Recycling of Waste Water (KL)		
Month	Cooling Tower Operation	Boiler Water	Portable	ETP Clarifier plus RO+UF Circuit for DM WATER Production	Ash Handling	STP
Apr-23	2062890	0	13649	95335	40719	7090
May-23	2008013	0	14822	154231	69575	6975
Jun-23	2221784	0	15660	106620	42326	7085
Jul-23	2065991	0	14878	87669	51427	6585
Aug-23	2069115	0	15430	90375	49220	6284
Sep-23	1731689	0	17730	95207	22079	6970
Oct-23	1732515	0	22494	61688	13668	7025
Nov-23	1820066	0	20263	61870	13752	8045
Dec-23	2220739	0	20034	64240	19701	8073
Jan-24	2301726	0	17900	66412	19052	8512
Feb-24	2081008	0	15220	67260	17261	8512
Mar-24	1958307	0	16822	57647	21813	7909
Total	24273843	0	204902	1008554	380593	89065

ANNEXURE – II

POWER GENERATION AND COAL CONSUMPTION DETAILS FOR FY 2023-24

Month	Month wise Gross Power Generation Details (MU)			Month wise Coal Consumption Details (MT)		
	Unit # 3	Unit # 4	Unit # 2	Unit # 3	Unit # 4	Unit # 2
Apr-23	239.5	336.6	330.3	166346	224374	217178
May-23	258.9	309.0	285.7	169614	201723	185528
Jun-23	270.7	338.4	356.2	176813	216236	224787
Jul-23	274.1	332.6	315.4	182763	211434	203664
Aug-23	319.3	350.0	292.7	218738	229541	192571
Sep-23	275.1	207.5	314.3	180516	135652	200924
Oct-23	0.00	380.5	336.9	0.00	243035	215242
Nov-23	30.1	358.3	377.7	20347	233196	248102
Dec-23	356.0	339.9	340.9	232555	225194	228557
Jan-24	377.0	329.7	353.5	234877	208409	226311
Feb-24	329.7	271.2	323.9	208315	172648	209277
Mar-24	289.2	302.2	213.0	186825	195040	139118
Total	3019.7	3855.8	3840.5	1977709	2496482	2491259

**Environmental Statement Report for 2023-24 of KSK Mahanadi Power Company Limited,
Operational Units No. - 3, 4 & 2 (3x600MW TPP)**

ANNEXURE - III

FY 2023-24											
Month	Coal consumed (MT)	Ash content of coal (%)	Ash Generation (MT)	Ash Utilization (MT)	% age Utilization	Fly ash based products viz. bricks, blocks, tiles (MT)	Cement manufacturing, ready mix concrete (MT)	Construction of road and fly over embankment (MT)	Filling up of low lying area (MT)	Filling of mine voids (MT)	Total (MT)
Apr-23	607898	35.1%	213415	213415	100%	1197	152835	20360	39023	0	213415
May-23	556865	35.4%	197098	197098	100%	1581	138273	37534	19710	0	197098
Jun-23	617836	35.4%	218635	218635	100%	4824	154277	33575	25959	0	218635
Jul-23	597861	35.2%	210259	210259	100%	2451	100591	54727	52490	0	210259
Aug-23	640850	35.3%	225997	203396	100%	2678	116635	42243	41840	0	203396
Sep-23	517092	35.2%	182171	163954	100%	2919	101195	17238	42602	0	163954
Oct-23	458277	35.3%	161584	202401	100%	5851	117790	25757	53003	0	202401
Nov-23	501645	35.3%	177014	177014	100%	5931	55825	47949	67309	0	177014
Dec-23	686306	35.3%	242041	242042	100%	5024	119433	43113	41594	32878	242042
Jan-24	669597	35.3%	236541	236541	100%	5354	140109	43637	32614	14827	236541
Feb-24	590240	35.1%	207381	207380	100%	6711	140320	18119	25091	17139	207380
Mar-24	520983	35.2%	183147	183148	100%	5713	158060	6928	12447	0	183148
TOTAL (MT)	6965450	35.2%	2455283	2455283	100%	50234	1495343	391180	453682	64844	2455283

DATA OF INDUSTRIAL EFFLUENT (Guard Pond) from APRIL 2023 - MARCH 2024

Month	pH	TSS (mg/l)	Oil & Grease (mg/l)
Apr-23	7.81	47.9	<1.0
May-23	7.1	55.6	<1.0
Jun-23	7.32	58.2	<1.0
Jul-23	7.49	62.7	<1.0
Aug-23	6.97	52.3	<1.0
Sep-23	7.28	60.3	<1.0
Oct-23	7.42	56.3	<1.0
Nov-23	7.38	62.1	<1.0
Dec-23	7.05	52.6	<1.0
Jan-24	7.52	61.8	<1.0
Feb-24	7.16	52.3	<1.0
Mar-24	7.44	56.8	<1.0
Average	7.3	56.6	<1.0

Monthly Source Emissions (Unit#3) - April'23 to Mar'24

Month	PM (mg/Nm³)	SO₂ (mg/Nm³)	NO_x (mg/Nm³)
Apr-23	40.1	812	408
May-23	37.6	843	376
Jun-23	40.6	903	392
Jul-23	37.7	968	406
Aug-23	35.8	892	396
Sep-23	38.3	905	372
Oct-23	SD	SD	SD
Nov-23	SD	SD	SD
Dec-23	7.2	735	325
Jan-24	6.6	715	356
Feb-24	7.9	732	332
Mar-24	8.94	764	358
Average	26.1	827	372

Monthly Source Emissions (Unit#4) - April'23 to Mar'24

Month	PM (mg/Nm³)	SO₂ (mg/Nm³)	NO_x (mg/Nm³)
Apr-23	38.41	771	373
May-23	39.7	815	408
Jun-23	42.8	882	388
Jul-23	10.8	816	357
Aug-23	11.4	781	330
Sep-23	13.6	804	355
Oct-23	11.5	866	347
Nov-23	11.7	884	360
Dec-23	12.0	768	330
Jan-24	11.3	735	322
Feb-24	11.8	768	350
Mar-24	11.58	782	371
Average	18.9	806	358

Monthly Source Emissions (Unit#2) - April'23 to Mar'24

Month	PM (mg/Nm³)	SO₂ (mg/Nm³)	NO_x (mg/Nm³)
Apr-23	27.2	891	380
May-23	26.0	793	355
Jun-23	27.5	820	374
Jul-23	28.2	912	394
Aug-23	26.9	877	368
Sep-23	23.8	927	395
Oct-23	22.9	934	397
Nov-23	23.2	893	382
Dec-23	23.7	855	398
Jan-24	28.3	764	321
Feb-24	26.25	805	388
Mar-24	23.8	783	366
Average	25.6	855	377

SUMMARY OF AMBIENT AIR QUALITY RESULTS FROM APRIL 2023 TO MARCH 2024

Inside Location:

1. BTG Area-

PM 2.5 ($\mu\text{g}/\text{m}^3$)				PM 10 ($\mu\text{g}/\text{m}^3$)				SO ₂ ($\mu\text{g}/\text{m}^3$)				NO _x ($\mu\text{g}/\text{m}^3$)				CO ($\mu\text{g}/\text{m}^3$)			
Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%
38.2	24.8	30.5	37.7	68.2	45.3	55.7	67.7	16.9	10.3	13.3	16.7	24.2	12.8	16.7	23.8	0.374	0.216	0.299	0.374

Arsenic ($\mu\text{g}/\text{m}^3$)				Nickel ($\mu\text{g}/\text{m}^3$)				Lead ($\mu\text{g}/\text{m}^3$)				O ₃ ($\mu\text{g}/\text{m}^3$)				NH ₃ ($\mu\text{g}/\text{m}^3$)			
Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%
<1.0	<1.0	<1.0	<1.0	2.3	<1.0	1.4	2.3	0.005	0.000	0.002	0.005	11.7	5.1	8.5	11.7	<20	<20	<20	<20

C ₆ H ₆ ($\mu\text{g}/\text{m}^3$)				Benzo (a) Pyrene ng/m ³				Hg ($\mu\text{g}/\text{m}^3$)			
Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%
<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.001	<0.001	<0.001	<0.001

2. CHP Area-

PM 2.5 ($\mu\text{g}/\text{m}^3$)				PM 10 ($\mu\text{g}/\text{m}^3$)				SO ₂ ($\mu\text{g}/\text{m}^3$)				NO _x ($\mu\text{g}/\text{m}^3$)				CO ($\mu\text{g}/\text{m}^3$)			
Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%
41.6	25.4	31.9	40.9	72.3	54.8	59.8	71.8	16.6	12.3	15.1	18.2	23.4	14.7	18.1	22.9	0.435	0.244	0.346	0.433

Arsenic ($\mu\text{g}/\text{m}^3$)				Nickel ($\mu\text{g}/\text{m}^3$)				Lead ($\mu\text{g}/\text{m}^3$)				O ₃ ($\mu\text{g}/\text{m}^3$)				NH ₃ ($\mu\text{g}/\text{m}^3$)			
Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%
<1.0	<1.0	<1.0	<1.0	3.2	<1.0	1.7	3.1	0.006	0	0.003	0.006	14.2	6.6	10.1	13.8	<20	<20	<20	<20

C ₆ H ₆ ($\mu\text{g}/\text{m}^3$)				Benzo (a) Pyrene ng/m ³				Hg ($\mu\text{g}/\text{m}^3$)			
Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%
<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.001	<0.001	<0.001	<0.001

3. DM Plant -

PM 2.5 (µg/m ³)				PM 10 (µg/m ³)				SO ₂ (µg/m ³)				NO _x (µg/m ³)				CO (µg/m ³)			
Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%
36.1	23.7	29	35.5	65.4	43.8	52.9	64.7	15.7	10.8	13.1	15.6	21.5	12.4	15.3	20.94	0.361	0.204	0.284	0.358

Arsenic (µg/m ³)				Nickel (µg/m ³)				Lead (µg/m ³)				O ₃ (µg/m ³)				NH ₃ (µg/m ³)			
Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%
<1.0	<1.0	<1.0	<1.0	2.4	<1.0	1.3	2.3	0.004	0.000	0.002	0.004	11.0	4.8	7.7	10.8	<20	<20	<20	<20

C ₆ H ₆ (µg/m ³)				Benzo (a) Pyrene ng/m ³				Hg (µg/m ³)			
Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%
<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.001	<0.001	<0.001	<0.001

4. AHP Area-

PM 2.5 (µg/m ³)				PM 10 (µg/m ³)				SO ₂ (µg/m ³)				NO _x (µg/m ³)				CO (µg/m ³)			
Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%
39.4	25.1	32.5	39.4	73.2	50.8	61.6	72.8	18.8	11.2	14.5	18.7	24.2	13.4	17.333	23.7	0.445	0.258	0.330	0.441

Arsenic (µg/m ³)				Nickel (µg/m ³)				Lead (µg/m ³)				O ₃ (µg/m ³)				NH ₃ (µg/m ³)			
Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%
<1.0	<1.0	<1.0	<1.0	3.2	<1.0	1.7	3.1	0.006	0.000	0.003	0.006	13.4	6.4	10.0	13.2	<20	<20	<20	<20

C ₆ H ₆ (µg/m ³)				Benzo (a) Pyrene ng/m ³				Hg (µg/m ³)			
Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%
<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.001	<0.001	<0.001	<0.001

SUMMARY FOR AMBIENT AIR QUALITY MONITORING RESULTS FROM APRIL 2023 TO MARCH 2024

Out Side of Plant Area:

1. Tarod village-

PM 2.5 ($\mu\text{g}/\text{m}^3$)				PM 10 ($\mu\text{g}/\text{m}^3$)				SO ₂ ($\mu\text{g}/\text{m}^3$)				NO _x ($\mu\text{g}/\text{m}^3$)				CO ($\mu\text{g}/\text{m}^3$)			
Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%
33.2	20.2	26.5	32.7	60.7	45.7	53.4	60.5	14.2	9.4	11.7	14.2	17.3	11.8	14.1	17.2	0.280	0.168	0.209	0.276
Arsenic ($\mu\text{g}/\text{m}^3$)				Nickel ($\mu\text{g}/\text{m}^3$)				Lead ($\mu\text{g}/\text{m}^3$)				O ₃ ($\mu\text{g}/\text{m}^3$)				NH ₃ ($\mu\text{g}/\text{m}^3$)			
Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.001	<0.001	<0.001	<0.001	6.2	4.2	6.0	8.9	<20	<20	<20	<20

C ₆ H ₆ ($\mu\text{g}/\text{m}^3$)				Benzo (a) Pyrene ng/m ³				Hg ($\mu\text{g}/\text{m}^3$)			
Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%
<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.001	<0.001	<0.001	<0.001

2. Jhalmala Village-

PM 2.5 ($\mu\text{g}/\text{m}^3$)				PM 10 ($\mu\text{g}/\text{m}^3$)				SO ₂ ($\mu\text{g}/\text{m}^3$)				NO _x ($\mu\text{g}/\text{m}^3$)				CO ($\mu\text{g}/\text{m}^3$)			
Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%
32.1	20.6	26.4	31.9	61.6	40.6	49.8	60.8	13.3	8.7	11.1	13.2	17.3	11.3	13.8	17.0	0.286	0.126	0.207	0.281
Arsenic ($\mu\text{g}/\text{m}^3$)				Nickel ($\mu\text{g}/\text{m}^3$)				Lead ($\mu\text{g}/\text{m}^3$)				O ₃ ($\mu\text{g}/\text{m}^3$)				NH ₃ ($\mu\text{g}/\text{m}^3$)			
Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.001	<0.001	<0.001	<0.001	8.6	3.8	5.9	8.5	<20	<20	<20	<20

C ₆ H ₆ ($\mu\text{g}/\text{m}^3$)				Benzo (a) Pyrene ng/m ³				Hg ($\mu\text{g}/\text{m}^3$)			
Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%
<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.001	<0.001	<0.001	<0.001

3. Amora village-

PM 2.5 (µg/m ³)				PM 10 (µg/m ³)				SO ₂ (µg/m ³)				NO _x (µg/m ³)				CO (µg/m ³)			
Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%
31.3	20.6	25.5	31.1	59.9	40.5	48.9	59.0	13.8	9.1	11.2	13.6	16.9	11.2	13.6	16.5	0.297	0.127	0.208	0.294

Arsenic (µg/m ³)				Nickel (µg/m ³)				Lead (µg/m ³)				O ₃ (µg/m ³)				NH ₃ (µg/m ³)			
Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.001	<0.001	<0.001	<0.001	8.6	4.3	6.0	8.3	<20	<20	<20	<20

C ₆ H ₆ (µg/m ³)				Benzo (a) Pyrene ng/m ³				Hg (µg/m ³)			
Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%
<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.001	<0.001	<0.001	<0.001

4. Sonsari village-

PM 2.5 (µg/m ³)				PM 10 (µg/m ³)				SO ₂ (µg/m ³)				NO _x (µg/m ³)				CO (µg/m ³)			
Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%
60.8	20.0	26.8	34.1	60.5	41.2	50.3	57.7	13.2	8.6	11.0	13.08	17.6	11.4	13.7	17.1	0.263	0.128	0.192	0.261

Arsenic (µg/m ³)				Nickel (µg/m ³)				Lead (µg/m ³)				O ₃ (µg/m ³)				NH ₃ (µg/m ³)			
Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.001	<0.001	<0.001	<0.001	8.9	3.7	6.1	8.7	<20	<20	<20	<20

C ₆ H ₆ (µg/m ³)				Benzo (a) Pyrene ng/m ³				Hg (µg/m ³)			
Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%
<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.001	<0.001	<0.001	<0.001

5. Nariyara village-

PM 2.5 ($\mu\text{g}/\text{m}^3$)				PM 10 ($\mu\text{g}/\text{m}^3$)				SO ₂ ($\mu\text{g}/\text{m}^3$)				NO _x ($\mu\text{g}/\text{m}^3$)				CO ($\mu\text{g}/\text{m}^3$)			
Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%
30.1	19.6	25.4	29.8	61.3	15.9	50.4	55.3	13.7	9.2	12.2	13.3	17.2	10.9	13.7	15.6	0.276	0.145	0.200	0.270

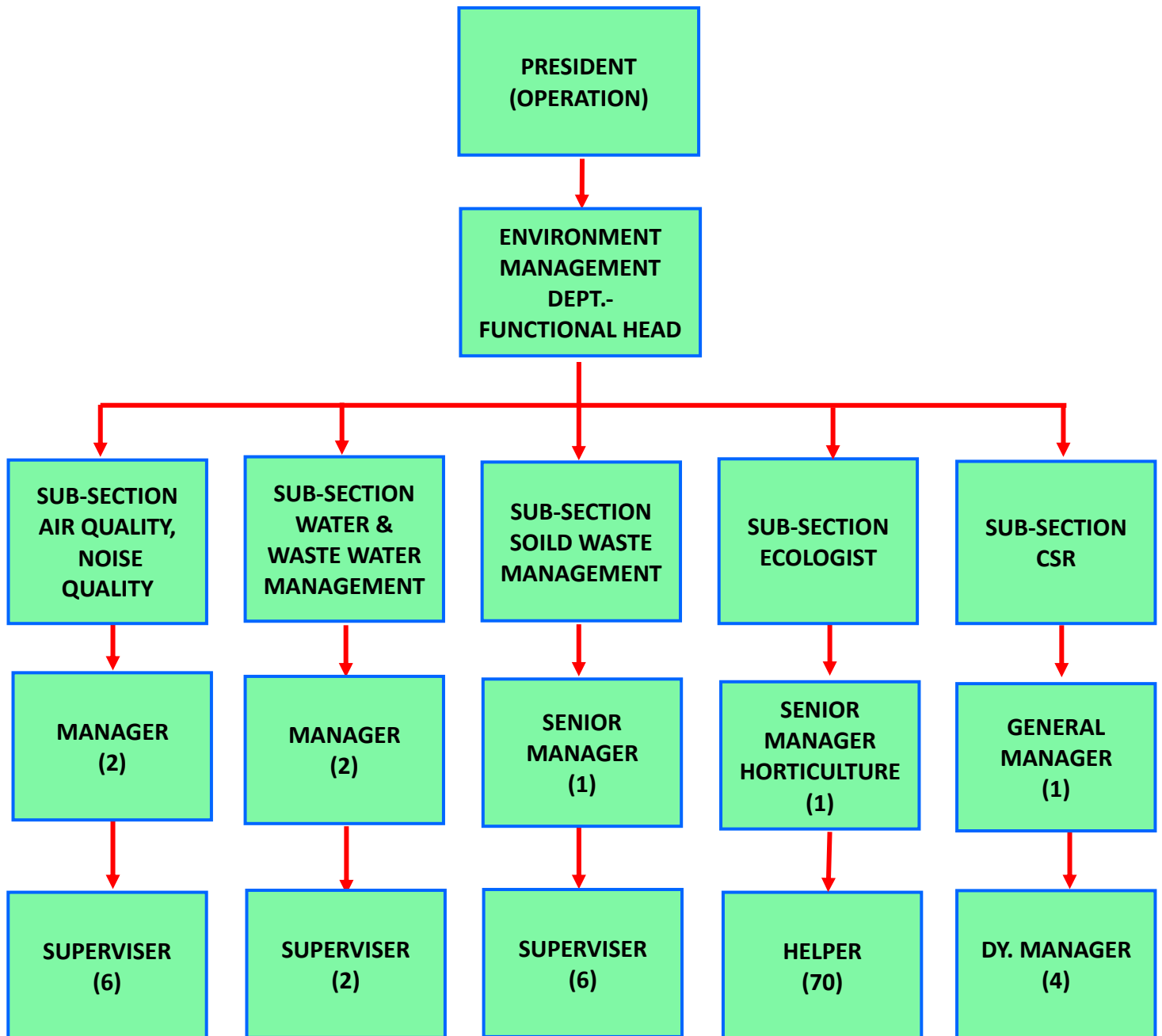
Arsenic ($\mu\text{g}/\text{m}^3$)				Nickel ($\mu\text{g}/\text{m}^3$)				Lead ($\mu\text{g}/\text{m}^3$)				O ₃ ($\mu\text{g}/\text{m}^3$)				NH ₃ ($\mu\text{g}/\text{m}^3$)			
Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.001	<0.001	<0.001	<0.001	9.5	3.9	5.9	9.2	<20	<20	<20	<20

C ₆ H ₆ ($\mu\text{g}/\text{m}^3$)				Benzo (a) Pyrene ng/m ³				Hg ($\mu\text{g}/\text{m}^3$)			
Max	Min	Avg	98%	Max	Min	Avg	98%	Max	Min	Avg	98%
<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.001	<0.001	<0.001	<0.001

Annexure-XIX

ENVIRONMENT MANAGEMENT CELL

(Organizational Chart)



Annexure-XX



भारत सरकार/Government of India
विद्युत मंत्रालय/Ministry of Power
केन्द्रीय विद्युत प्राधिकरण/ Central Electricity Authority
तापीय परियोजना प्रबोधन प्रभाग/Thermal Project Monitoring Division-II

No.CEA/TPM-II/Misc./13/2018/430

Dated 12.03.2018

The Director,
M/s KSK Mahanadi Power Company Ltd.,
431/A, Road No.22, Jubilee Hills,
HYDERABAD-500033, TELANGANA


Subject: Intimation regarding COD dates in respect of Akaltara TPP (6x600 MW) for coal linkage under SHAKTI Scheme.

Sir,

This has reference to your letter No.CEA, ND /DYSR/1500104/36 dated 12.03.18 wherein it is requested to provide COD dates in respect of Akaltara TPP, four units as per new nomenclature are 3, 4, 2, and 5 (4x600MW) being implemented by M/s. KSK Mahanadi Power Company Ltd.in the state of Chhattisgarh. These COD dates are required in connection of Shakti – B(ii) Scheme. Three units of 600 MW each have already commissioned and achieved CODs. Fourth unit of 600 MW is expected to be commissioned / COD in 2018-19. The details of four units of M/s KSK Mahanadi Power Company Limited are furnished below:

Unit Name (As per New Nomenclature of units)	Date of Commercial Operation (COD)	Balance Life of unit (25 years from COD)*
Unit-3	14.08.2013(Actual)	Up to 13.08.2038
Unit-4	26.08.2014(Actual)	Up to 25.08.2039
Unit-2	28.02.2018(Actual)	Up to 27.02.2043
Unit-5	2018-19 (Anticipated 31.10.2018)	25 years from actual <u>COD</u>

*As per definition of Useful Life in CERC Regulation.


(M. P. Singh)
Chief Engineer

Annexure-XXI

1) Photographs of Off-line Display Board containing Consent Status & Hazardous Waste information installed at Main Gate:



2) Online Display Board installed at Main Gate showing online status of Environmental Parameters:



Annexure-XXII



INDEX		Area in Ac
TOTAL AREA		2192
MAIDU PLANT		251
COAL HANDLING PLANT		235
EXISTENCE		455
GREEN BELT		274
CONSTRUCTION INFRASTRUCTURE		195
Details of Construction Infrastructure:-		
KSK Site Hostel = 3.08Ac, SEPCO Site Hostel = 5.89Ac		
Labour Colony (1), (2) & (3) = 29.02+217+273= 57.81Ac		
Other Areas(RAC plants, Storage & Fabrication yards etc.) = 329.20Ac		

Notes: Areas shown above are in Acre.



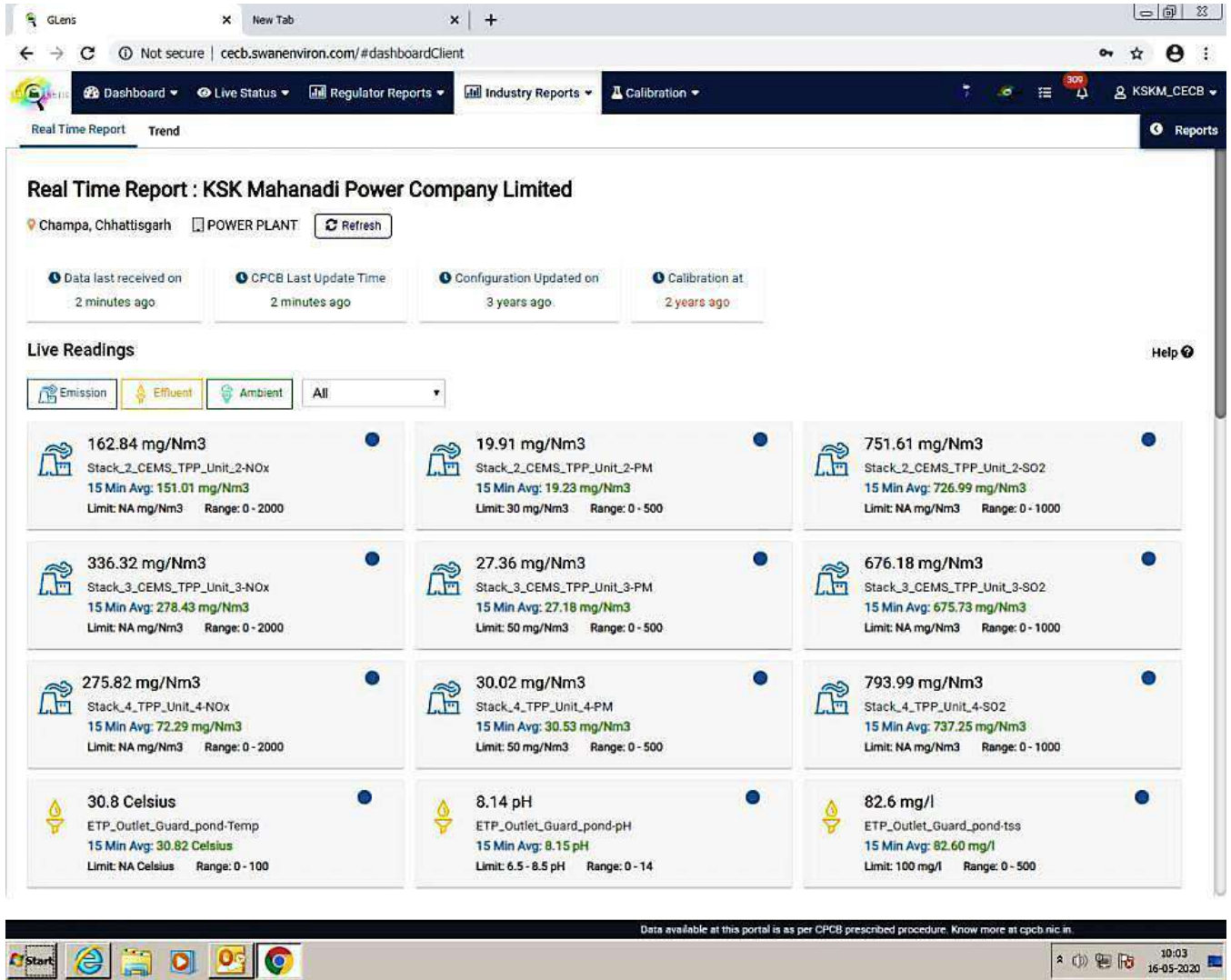
KSK Mahandi Power Company Limited
6 x 660 MW Thermal Power Project
Mahandi, Chhattisgarh, India

AREA STATEMENT

Annexure-XXIII

Photographs of Online Monitoring equipments installed in KMPCL

1. Screenshot for Real time data transmission for CEMS, CEQMS & CAAQMS to CPCB Sever through G-Lens software:

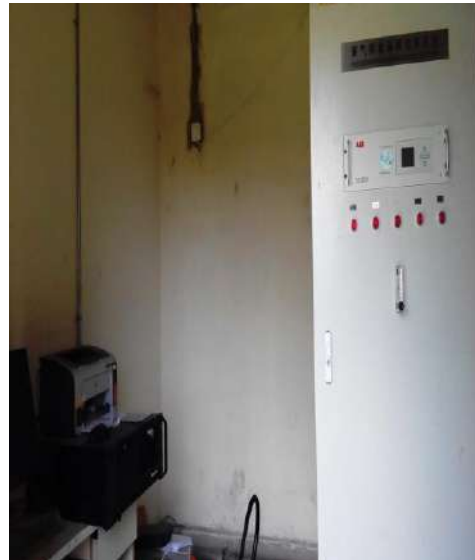


2. CEMS installed at Stack-I, II & III:

Dust Monitor



SO₂, NO_x & CO Analysers and Dust Monitor



3. CEQMS installed in Guard Pond Water:



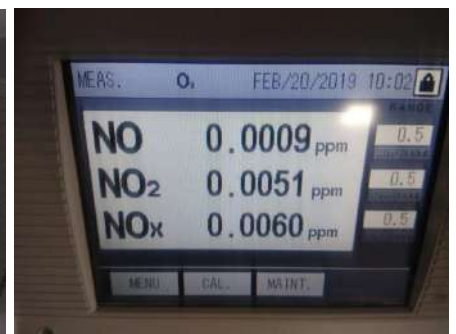
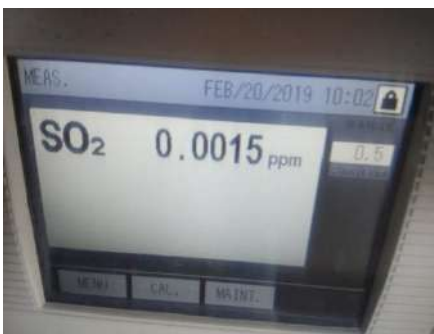


4. CAAQMS installed at 04 different locations inside Campus.

I) CAAQMS-1 installed in Main Gate



CAAQMS readings display at Analysers



ii) CAAQMS-2 installed near Switch Yard.



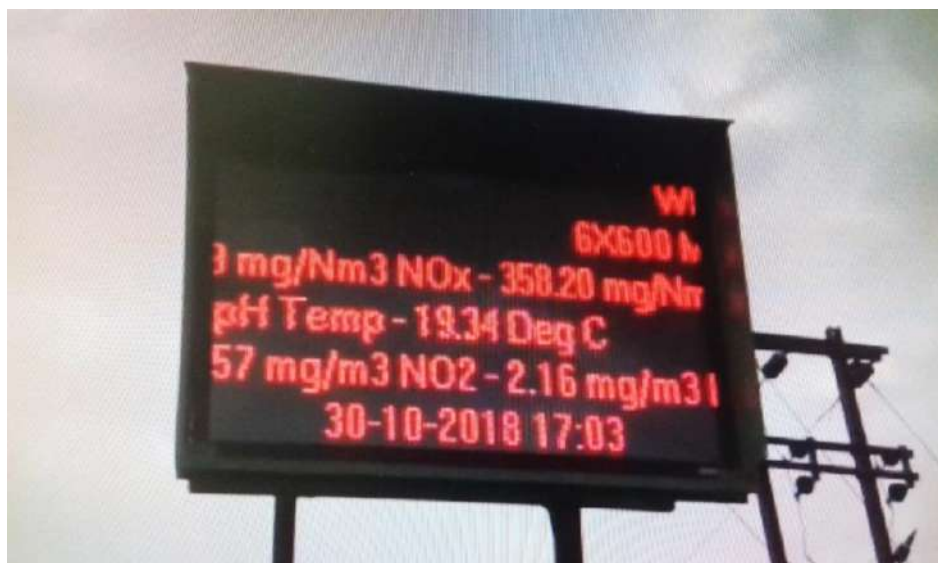
iii) CAAQMS-3 installed at Sub-station.



iv) CAAQMS installed at Camp office.



5. Display Board showing online status of Environmental Parameters at Main Gate:



Annexure-XXIV

Precautionary measures for Fugitive emission control at site.

1) Road Water Sprinkling at all internal Roads:



2) Water Sprinklers installed at Dust prone areas:



2) Bag filters installed at Ash SILO and Raw materials handling areas:



Bag Filter installed at Raw materials handling systems



4) Thick layer of green belt developed around plant boundary to arrest fugitive emission:



Annexure-XXV

**KSK Mahanadi Power Company Limited**

CIN No. : U40300TG2009PLC064062

Works

Near Nariyara Village,
Akaltara Tehsil,
Janjgir - Champa District,
Chhattisgarh Pin : 495553
Tel (Site): 07817-284001

Registered Office

8-2-293/82/A/431/A,
Road No. 22 Jubilee Hills
Hyderabad - 500033,
Tel: +91-40-23559922-25
Tel: +91-40-23558701
Fax: +91-40235530

CPCB, ND/BPSN/2500108/457**Date: 30.05.2024**

To
The Divisional Head-IPC-II,
Central Pollution Control Board,
East Arjun Nagar, Shahadara,
Delhi-110032

(Kind Attention to Mr. Nazimuddin)**Sub:** - Submission of Annual Fly Ash Utilization Report for FY2023-2024-Reg.**Ref.:-** i) MoEF&CC fly ash notification S.O. 5481(E) dated 31st December 2021
ii) Fly Ash Notification S.O.2804, 3rd November 2009**Sir,**

With reference to the above subject and cited reference, we are enclosing herewith the Annual **Fly Ash Generation & Utilization data for FY 2023-24** in the prescribed format for M/s KSK Mahanadi Power Company Limited, Village-Nariyara, Akaltara, Chhattisgarh.

This is for your kind acknowledgement & perusal please.

Thanking you,

Your's faithfully

For M/s **KSK Mahanadi Power Company Limited.**

Dr. M.V.R.N Acharyulu
(Authorized Signatory)

Encl. - Annual Fly Ash Generation & Utilization Report for FY 2023-24.


Ash Compliance Report (for the period 1st April 2023 to 31st March 2024) to be submitted on or before 31st May.

SN.	Details	
1.	Name of Power Plant	M/s K.S.K Mahanadi Power Company Ltd.
2.	Name of the company	M/s K.S.K Mahanadi Power Company Ltd.
3.	District	Janjgir-Champa
4.	State	Chhattisgarh
5.	Postal address for communication:	M/s KSK Mahanadi Power Company Ltd., Village-Nariyara, Tehsil-Akaltara, District- Janjgir,-Champa, Chhattisgarh, Pin-495553
6.	E-mail:	acharyulu.m@ksk.co.in; env.kmpcl@ksk.co.in
7.	Power Plant installed capacity (MW):	3x600 MW
8.	Plant Load Factor (PLF):	67.79 %
9.	No. of units generated (MWh):	10715992 MWh
10.	Total area under power plant (ha): (including area under ash ponds)	828.46 Ha.
11.	Quantity of coal consumption during reporting period (Metric Tons per Annum):	69,65,450 MT
12.	Average ash content in percentage (per cent):	35.2 %
13.	Quantity of current ash generation during reporting period (Metric Tons per Annum):	24,55,284 MT
	Fly ash (Metric Tons per Annum):	22,09,756 MT
	Bottom ash (Metric Tons per Annum):	2,45,529 MT
14.	Capacity of dry fly ash storage silo(s) (Metric Tons) :	i) 2x3800 m ³ =7600 m ³ (volume) ii) 7600 x 0.75 = 5700 MT (Fly ash Qty.)
15.	Details of utilisation of current ash generated during reporting period	
	(a) Total quantity of current ash utilised (MTPA) during reporting period:	24,55,284 MT
	(b) Quantity of fly ash utilised (MTPA):	22,09,756 MT
	(i) Fly ash based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels)	50,235 MT
	(ii) Cement manufacturing:	14,95,343 MT

	(iii) Ready mix concrete:	--
	(iv) Ash and Geo-polymer based construction material:	--
	(v) Manufacturing of sintered or cold bonded ash aggregate:	--
	(vi) Construction of roads, road and fly over embankment:	2,70,536 MT
	(vii) Construction of dams:	--
	(viii) Filling up of low lying area:	3,34,646 MT
	(ix) Filling of mine voids:	58,996 MT
	(x) Use in overburden dumps:	--
	(xi) Agriculture:	--
	(xii) Construction of shoreline protection structures in coastal districts;	--
	(xiii) Export of ash to other countries:	--
	(xiv) Others (please specify):	--
	(c) Quantity of bottom ash utilised (MTPA):	2,45,529 MT
	(i) Fly ash based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels)	--
	(ii) Cement manufacturing:	--
	(iii) Ready mix concrete:	--
	(iv) Ash and Geo-polymer based construction material:	--
	(v) Manufacturing of sintered or cold bonded ash aggregate:	--
	(vi) Construction of roads, road and fly over embankment:	1,20,645 MT
	(vii) Construction of dams:	--
	(viii) Filling up of low lying area:	1,19,036 MT
	(ix) Filling of mine voids:	5,848 MT
	(x) Use in overburden dumps:	--
	(xi) Agriculture:	--

	(xii) Construction of shoreline protection structures in coastal districts;	--	
	(xiii) Export of ash to other countries:	--	
	(xiv) Others (please specify):	--	
	Total quantity of current ash un-utilised (MTPA) during reporting period:	0.0 MT	
16.	Percentage utilisation of current ash generated during reporting period (per cent):	100 %	
17.	Details of disposal of ash in ash ponds		
	(a) Total quantity of ash disposed in ash pond(s) (Metric Tons) as on 31st March (excluding reporting period):	2,43,986 MT	
	(b) Quantity of ash disposed in ash pond(s) during reporting period (Metric Tons):	0.0 MT	
	(c) Total quantity of water consumption for slurry discharge into ash ponds during reporting period (m3):	1,47,317 m3	
	(d) Total number of ash ponds: (i) Active: (ii) Exhausted (yet to be reclaimed): (iii) Reclaimed:	(i) Active: 2 nos. (ii) Exhausted : NIL (iii) Reclaimed: NIL	
	(e) total area under ash ponds (ha):	66 Hectare	
18.	Individual ash pond details		
	<i>Ash pond-1,2, etc. (please provide below mentioned details separately, if number of ash ponds is more than one)</i>	Pond-1 (Fly ash storage)	Pond-2 (Bottom ash storage)
	(a) Status: Under construction or Active or Exhausted or Reclaimed	Active	Active
	(b) Date of start of ash disposal in ash pond (DD/MM/YYYY or MMYYYY):	14.08.2013	14.08.2013
	(c) Date of stoppage of ash disposal in ash pond after completing its capacity (DD/MM/YYYY or MM/YYYY): (Not applicable for active ash ponds)	Active Not applicable	Active Not applicable
	(c) area (hectares):	32.5Ha	33.5Ha.
	(d) dyke height (m):	7.9m	11.3m
	(d) volume (m3):	13,84,000 m3	46,67,000 m3

	(e) quantity of ash disposed as on 31st March (Metric Tons):	49,227 MT	1,73,052 MT
	(f) available volume in percentage (per cent) and quantity of ash can be further disposed (Metric Tons):	24,50,773 MT 98%	44,93,948 MT 96%
	(g) expected life of ash pond (number of years and months):	Not applicable 100% fly ash utilization has been achieved	Not applicable 100% fly ash utilization has been achieved
	(e) co-ordinates (Lat and Long): (please specify minimum 4 co-ordinates)	21°57'14"N 21°57'37"N 82° 24'20"E 82°23'54"E 21°57'46"N 21°57'33"N 82° 23'58"E 82° 24'16"E	21°57'46"N 21°57'42"N 82° 24'57"E 82°23'22"E 21°57'26"N 21°57'42"N 82° 23'15"E 82° 24'56"E
	(f) type of lining carried in ash pond: HDPE lining or LDPE lining or clay lining or No lining	HDPE lining	HDPE lining
	g) mode of disposal: Dry disposal or wet slurry (in case of wet slurry please specify whether HCSD or MCSD or LCSD)	High Concentration Slurry Disposal System	Lean Slurry Disposal System
	(h) Ratio of ash: water in slurry mix (1:___):	1:0.538	1:2.3
	(i) Ash water recycling system (AWRS) installed and functioning: Yes or No	Not available	Not available
	(j) Quantity of wastewater from ash pond discharged into land or water body (m3):	NIL	NIL
	(k) Last date when the dyke stability study was conducted and name of the organisation who conducted the study:	Work order has been awarded to Rajiv Gandhi University of knowledge Technologies, Andra Pradesh on 16.04.2024 for audit the stability of Ash dyke and Annual compliance of Fly ash. Field inspection report is awaited.	
	(l) Last date when the audit was conducted and name of the organisation who conducted the audit:	Last date of audit: 08.07.2024 Name of organisation: Rajiv Gandhi University of Knowledge Technologies, NUZVID, Eluru District, Andra Pradesh under NIT Warangal.	
19.	Quantity of legacy ash utilised (MTPA):	21,707 MT	
	i. Fly ash based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels):	--	
	ii. Cement manufacturing:	--	
	iii. Ready mix concrete:	--	
	iv. Ash and Geo-polymer based construction	--	

	material:			
	v. Manufacturing of sintered or cold bonded ash aggregate:			--
	vi. Construction of roads, road and flyover embankment:			--
	vii. Construction of dams:			--
	viii. Filling up of low lying area:			21,707 MT
	ix. Filling of mine voids:			--
	x. Use in overburden dumps:			--
	xi. Agriculture:			--
	xii. Construction of shoreline protection structures in coastal districts;			--
	xiii. Export of ash to other countries:			--
	xiv. Others (please specify):			--
	Summary:			
20.	Details	Quantity generated (MTP)	Quantity utilised (MTP) and (per cent)	Balance quantity (MTP)
	Current ash during reporting period	24,55,284 MT	24,55,284 MT (100%)	0.0
	Legacy ash	2,43,986 MT (Balance stocked as on 31 st Mar 2023)	21,707 MT (9%)	2,22,279 MT
	Total	26,99,270 MT	24,76,991 MT (101%)	2,22,279 MT
21.	Any other information: Soft copy of the annual compliance report, and shape files of power plant and ash ponds may be e-mailed to: moefcccoalash@gov.in			Noted.
22.	Signature of Authorised Signatory			

Annexure-XXVI

GREEN BELT LAYOUT PLAN

Total Greenbelt area: 277 ha

Developed Greenbelt: 277 ha

Planted: 7,20,000 plants



INDEX	DESCRIPTION	AREA IN AC
1	TOTAL AREA	277
2	MAIN PLANT	351
3	COAL HANDLING PLANT	250
4	GREEN BELT	277
5	CONSTRUCTION INFRASTRUCTURE	277

Details of Construction Infrastructure:

KSK Site Hostel = 3.08Ac, SEFOO Site Hostel = 6.89Ac
 Labour Colony (1), (2) & (3) = 33.02+2.17+2.73= 37.91Ac
 Other Areas (RMC plants, Storage & Fabrication yards etc.) = 329.20Ac

Annexure-XXVII

Environment Policy

We, at KSK Mahanadi Power Company Limited, believe that environment is elixir of life and a stake holder.

Ensuring sustainable environment management systems at all of our power plants is as important as any of our business propositions

We commit ourselves to achieve this by:

- **Ensuring total compliance with all applicable Rules, Regulations and Statutory provisions pertaining to Environment**
- **Minimizing the environmental risk by adopting efficient environment management system and good housekeeping practices**
- **Integrating environment management system, practices and procedures with all our activities**
- **Maintain a pro-active approach to provide and maintain efficient and healthy pollution control & monitoring equipment and thus healthy environment in and around the plant by constant monitoring of the function of pollution control equipment; emissions and discharges and housekeeping status with involvement of all our employees**
- **Always considering environment protection including waste minimization and resource conservation aspect as one of the essential criteria in power plant operations and in choice of selection of equipment, plant & technology etc.,**
- **Promoting awareness and inculcating the culture of healthy environment management by educating and training of staff**
- **Striving hard for continual improvement in the implementation of sustainable environment management and pollution control systems**

President

Annexure-XXVIII

Vimta Labs Limited

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ISSUED TO:

M/S. KSK MAHANADHI POWER COMPANY LTD,
NARIYARA VILLAGE,
AKALTARA TEHSIL,
JANJGIR-CHAMPA DISTRICT
CHHATTISGARH,

Report Number : VLL/VLS/24/01389/001
Issue Date : 2024.05.02
P.O. Number : 2019-20/MHKB/HO/KMPCL/
VILL/AMEND/2026-5
P.O. Date : 30.04.2024

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Customer Provided Details:			
Sample Name:	Coal Sample		
Test Required:	Proximate Analysis, Ultimate and GCV Analysis		
Lab Provided Details:			
Sampling Date:	2024.04.19	Sample Registration Date:	2024.04.22
Analysis Starting Date:	2024.04.22	Analysis Completion Date:	2024.04.30
Quantity Received:	~100 gm X 1 No.		
Sampling Details:	Coal Sample As-Received Basis		
Method of Testing:	As per IS:1350(P-I), IS:1350(P-II), IS:1350(P-III), ASTM D5373 & ASTM D6349		


TEST REPORT

Sr. No.	Test Parameters	UoM	Results
1	Proximate Analysis		
i	Total Moisture	%	11.14
ii	Ash	%	35.53
iii	Volatile Matter	%	21.84
iv	Fixed Carbon	%	26.39
2	Ultimate Analysis		
iv	Sulphur	%	0.36
3	Calorific Value Analysis		
i	Gross Calorific Value	Kcal/Kg	3468
4	Heavy Metal Analysis		
i	Arsenic	mg/kg	1.65
ii	Mercury	mg/kg	0.21
iii	Cadmium	mg/kg	0.32
iv	Zinc	mg/kg	9.54
v	Cobalt	mg/kg	4.13
vi	Lead	mg/kg	2.71
Vii	Titanium	mg/kg	4.01
viii	Aluminum	mg/kg	6.43

Results relate only to the sample tested.

Remarks: Proximate & Ultimate, and GCV analysis tested as received basis.

Name and Designation of Authorized Signatory


Dr. SubbaReddy Mallampati
Manager - Environment.

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Customer Provided Details:			
Sample Name:	Coal Sample		
Test Required:	Proximate Analysis, Ultimate and GCV Analysis		
Lab Provided Details:			
Sampling Date:	2024.04.19	Sample Registration Date:	2024.04.22
Analysis Starting Date:	2024.04.22	Analysis Completion Date:	2024.04.30
Quantity Received:	~100 gm X 1 No.		
Sampling Details:	Coal Sample Air Dried Basis		
Method of Testing:	As per IS:1350(P-I), IS:1350(P-II), IS:1350(P-III), ASTM D5373		

TEST REPORT

Sr. No.	Test Parameters	UoM	Results
1	Proximate Analysis		
i	Total Moisture	%	2.73
ii	Ash	%	35.81
iii	Volatile Matter	%	23.93
iv	Fixed Carbon	%	28.93
2	Ultimate Analysis		
iv	Sulphur	%	0.39
3	Calorific Value Analysis		
i	Gross Calorific Value	Kcal/Kg	3800

Results relate only to the sample tested.

Remarks: Proximate & Ultimate, and GCV analysis tested as received basis.

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Report Number : VLL/VLS/24/03025/001
Issue Date : 2024.06.03
P.O. Number : 2019-20/MHKB/HO/KMPCL/
VILL/AMEND/2026-5
P.O. Date : 30.04.2024

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Customer Provided Details:			
Sample Name:	Coal Sample		
Test Required:	Proximate Analysis, Ultimate and GCV Analysis		
Lab Provided Details:			
Sampling Date:	2024.05.21	Sample Registration Date:	2024.05.23
Analysis Starting Date:	2024.05.23	Analysis Completion Date:	2024.05.31
Quantity Received:	~100 gm X 1 No.		
Sampling Details:	Coal Sample As-Received Basis		
Method of Testing:	As per IS:1350(P-I), IS:1350(P-II), IS:1350(P-III), ASTM D5373 & ASTM D6349		

TEST REPORT

Sr. No.	Test Parameters	UoM	Results
1	Proximate Analysis		
i	Total Moisture	%	11.38
ii	Ash	%	35.59
iii	Volatile Matter	%	21.99
iv	Fixed Carbon	%	27.04
2	Ultimate Analysis		
iv	Sulphur	%	0.37
3	Calorific Value Analysis		
i	Gross Calorific Value	Kcal/Kg	3568
4	Heavy Metal Analysis		
i	Arsenic	mg/kg	1.82
ii	Mercury	mg/kg	0.18
iii	Cadmium	mg/kg	0.21
iv	Zinc	mg/kg	12.4
v	Cobalt	mg/kg	6.08
vi	Lead	mg/kg	3.32
Vii	Titanium	mg/kg	3.62
viii	Aluminum	mg/kg	5.32

Results relate only to the sample tested.

Remarks: Proximate & Ultimate, and GCV analysis tested as received basis.

Name and Designation of Authorized Signatory

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P.O. Date : 30.04.2024

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Customer Provided Details:			
Sample Name:	Coal Sample		
Test Required:	Proximate Analysis, Ultimate and GCV Analysis		
Lab Provided Details:			
Sampling Date:	2024.05.21	Sample Registration Date:	2024.05.23
Analysis Starting Date:	2024.05.23	Analysis Completion Date:	2024.05.31
Quantity Received:	~100 gm X 1 No.		
Sampling Details:	Coal Sample Air Dried Basis		
Method of Testing:	As per IS:1350(P-I), IS:1350(P-II), IS:1350(P-III), ASTM D5373		

TEST REPORT

Sr. No.	Test Parameters	UoM	Results
1	Proximate Analysis		
i	Total Moisture	%	2.57
ii	Ash	%	35.89
iii	Volatile Matter	%	24.19
iv	Fixed Carbon	%	29.75
2	Ultimate Analysis		
iv	Sulphur	%	0.41
3	Calorific Value Analysis		
i	Gross Calorific Value	Kcal/Kg	3925

Results relate only to the sample tested.

Remarks: Proximate & Ultimate, and GCV analysis tested as received basis.

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**M/S. KSK MAHANADHI POWER COMPANY LTD,
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JANJGIR-CHAMPA DISTRICT
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**Report Number : VLL/VLS/24/06319/001
Issue Date : 2024.06.26
P.O. Number : 2019-20/MHKB/HO/KMPCL/
VILL/AMEND/2026-5
P.O. Date : 30.04.2024**

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Customer Provided Details:			
Sample Name:	Coal Sample		
Test Required:	Proximate Analysis, Ultimate and GCV Analysis		
Lab Provided Details:			
Sampling Date:	2024.06.14	Sample Registration Date:	2024.06.17
Analysis Starting Date:	2024.06.17	Analysis Completion Date:	2024.06.25
Quantity Received:	~100 gm X 1 No.		
Sampling Details:	Coal Sample As-Received Basis		
Method of Testing:	As per IS:1350(P-I), IS:1350(P-II), IS:1350(P-III), ASTM D5373 & ASTM D6349		

TEST REPORT

Sr. No.	Test Parameters	UoM	Results
1	Proximate Analysis		
i	Total Moisture	%	11.42
ii	Ash	%	35.86
iii	Volatile Matter	%	21.46
iv	Fixed Carbon	%	28.25
2	Ultimate Analysis		
iv	Sulphur	%	0.40
3	Calorific Value Analysis		
i	Gross Calorific Value	Kcal/Kg	3646
4	Heavy Metal Analysis		
i	Arsenic	mg/kg	1.46
ii	Mercury	mg/kg	0.14
iii	Cadmium	mg/kg	0.30
iv	Zinc	mg/kg	10.84
V	Cobalt	mg/kg	4.75
vi	Lead	mg/kg	3.73
Vii	Titanium	mg/kg	4.43
viii	Aluminum	mg/kg	7.11

Results relate only to the sample tested.

Remarks: Proximate & Ultimate, and GCV analysis tested as received basis.

Name and Designation of Authorized Signatory



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Report Number : VLL/VLS/24/06319/002
Issue Date : 2024.06.26
P.O. Number : 2019-20/MHKB/HO/KMPCL/
VILL/AMEND/2026-5
P.O. Date : 30.04.2024

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Customer Provided Details:			
Sample Name:	Coal Sample		
Test Required:	Proximate Analysis, Ultimate and GCV Analysis		
Lab Provided Details:			
Sampling Date:	2024.06.14	Sample Registration Date:	2024.06.17
Analysis Starting Date:	2024.06.17	Analysis Completion Date:	2024.06.25
Quantity Received:	~100 gm X 1 No.		
Sampling Details:	Coal Sample Air Dried Basis		
Method of Testing:	As per IS:1350(P-I), IS:1350(P-II), IS:1350(P-III), ASTM D5373		

TEST REPORT

Sr. No.	Test Parameters	UoM	Results
1	Proximate Analysis		
i	Total Moisture	%	3.34
ii	Ash	%	35.88
iii	Volatile Matter	%	23.44
iv	Fixed Carbon	%	30.84
2	Ultimate Analysis		
iv	Sulphur	%	0.44
3	Calorific Value Analysis		
i	Gross Calorific Value	Kcal/Kg	3979

Results relate only to the sample tested.

Remarks: Proximate & Ultimate, and GCV analysis tested as received basis.

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Report Number : VLL/VLS/24/07503/001
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VILL/AMEND/2026-5
P.O. Date : 30.04.2024

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Customer Provided Details:			
Sample Name:	Coal Sample		
Test Required:	Proximate Analysis, Ultimate and GCV Analysis		
Lab Provided Details:			
Sampling Date:	2024.07.23	Sample Registration Date:	2024.07.25
Analysis Starting Date:	2024.07.25	Analysis Completion Date:	2024.08.01
Quantity Received:	~100 gm X 1 No.		
Sampling Details:	Coal Sample As-Received Basis		
Method of Testing:	As per IS:1350(P-I), IS:1350(P-II), IS:1350(P-III), ASTM D5373 & ASTM D6349		

TEST REPORT

Sr. No.	Test Parameters	UoM	Results
1	Proximate Analysis		
i	Total Moisture	%	14.13
ii	Ash	%	36.21
iii	Volatile Matter	%	21.17
iv	Fixed Carbon	%	26.26
2	Ultimate Analysis		
iv	Sulphur	%	0.35
3	Calorific Value Analysis		
i	Gross Calorific Value	Kcal/Kg	3412
4	Heavy Metal Analysis		
i	Arsenic	mg/kg	1.73
ii	Mercury	mg/kg	0.19
iii	Cadmium	mg/kg	0.24
iv	Zinc	mg/kg	8.51
V	Cobalt	mg/kg	5.39
vi	Lead	mg/kg	2.81
Vii	Titanium	mg/kg	5.03
viii	Aluminum	mg/kg	8.04

Results relate only to the sample tested.

Remarks: Proximate & Ultimate, and GCV analysis tested as received basis.

Name and Designation of Authorized Signatory

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Customer Provided Details:			
Sample Name:	Coal Sample		
Test Required:	Proximate Analysis, Ultimate and GCV Analysis		
Lab Provided Details:			
Sampling Date:	2024.07.23	Sample Registration Date:	2024.07.25
Analysis Starting Date:	2024.07.25	Analysis Completion Date:	2024.08.01
Quantity Received:	~100 gm X 1 No.		
Sampling Details:	Coal Sample Air Dried Basis		
Method of Testing:	As per IS:1350(P-I), IS:1350(P-II), IS:1350(P-III), ASTM D5373		

TEST REPORT

Sr. No.	Test Parameters	UoM	Results
1	Proximate Analysis		
i	Total Moisture	%	4.79
ii	Ash	%	35.95
iii	Volatile Matter	%	23.50
iv	Fixed Carbon	%	29.17
2	Ultimate Analysis		
iv	Sulphur	%	0.39
3	Calorific Value Analysis		
i	Gross Calorific Value	Kcal/Kg	3790

Results relate only to the sample tested.

Remarks: Proximate & Ultimate, and GCV analysis tested as received basis.

Name and Designation of Authorized Signatory



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Report Number : VLL/VLS/24/09852/001
Issue Date : 2024.09.03
P.O. Number : 2019-20/MHKB/HO/KMPCL/
VILL/AMEND/2026-5
P.O. Date : 30.04.2024

Page 1 of 1

Customer Provided Details:			
Sample Name:	Coal Sample		
Test Required:	Proximate Analysis, Ultimate and GCV Analysis		
Lab Provided Details:			
Sampling Date:	2024.08.21	Sample Registration Date:	2024.08.23
Analysis Starting Date:	2024.08.23	Analysis Completion Date:	2024.09.02
Quantity Received:	~100 gm X 1 No.		
Sampling Details:	Coal Sample As-Received Basis		
Method of Testing:	As per IS:1350(P-I), IS:1350(P-II), IS:1350(P-III), ASTM D5373 & ASTM D6349		

TEST REPORT

Sr. No.	Test Parameters	UoM	Results
1	Proximate Analysis		
i	Total Moisture	%	14.49
ii	Ash	%	34.99
iii	Volatile Matter	%	20.96
iv	Fixed Carbon	%	25.96
2	Ultimate Analysis		
iv	Sulphur	%	0.35
3	Calorific Value Analysis		
i	Gross Calorific Value	Kcal/Kg	3383
4	Heavy Metal Analysis		
i	Arsenic	mg/kg	1.55
ii	Mercury	mg/kg	0.13
iii	Cadmium	mg/kg	0.18
iv	Zinc	mg/kg	11.52
v	Cobalt	mg/kg	3.64
vi	Lead	mg/kg	3.61
vii	Titanium	mg/kg	3.91
viii	Aluminum	mg/kg	6.43

Results relate only to the sample tested.

Remarks: Proximate & Ultimate, and GCV analysis tested as received basis.

Name and Designation of Authorized Signatory

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P.O. Date : 30.04.2024

Page 1 of 1

Customer Provided Details:			
Sample Name:	Coal Sample		
Test Required:	Proximate Analysis, Ultimate and GCV Analysis		
Lab Provided Details:			
Sampling Date:	2024.08.21	Sample Registration Date:	2024.08.23
Analysis Starting Date:	2024.08.23	Analysis Completion Date:	2024.09.02
Quantity Received:	~100 gm X 1 No.		
Sampling Details:	Coal Sample Air Dried Basis		
Method of Testing:	As per IS:1350(P-I), IS:1350(P-II), IS:1350(P-III), ASTM D5373		

TEST REPORT

Sr. No.	Test Parameters	UoM	Results
1	Proximate Analysis		
i	Total Moisture	%	5.06
ii	Ash	%	35.76
iii	Volatile Matter	%	23.31
iv	Fixed Carbon	%	28.88
2	Ultimate Analysis		
iv	Sulphur	%	0.39
3	Calorific Value Analysis		
i	Gross Calorific Value	Kcal/Kg	3763

Results relate only to the sample tested.

Remarks: Proximate & Ultimate, and GCV analysis tested as received basis.

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AKALTARA TEHSIL,
JANJGIR-CHAMPA DISTRICT
CHHATTISGARH,

Report Number : VLL/VLS/24/12035/001
Issue Date : 2024.10.03
P.O. Number : 2019-20/MHKB/HO/KMPCL/
VILL/AMEND/2026-5
P.O. Date : 30.04.2024

Page 1 of 1

Customer Provided Details:			
Sample Name:	Coal Sample		
Test Required:	Proximate Analysis, Ultimate and GCV Analysis		
Lab Provided Details:			
Sampling Date:	2024.09.20	Sample Registration Date:	2024.09.23
Analysis Starting Date:	2024.09.23	Analysis Completion Date:	2024.10.01
Quantity Received:	~100 gm X 1 No.		
Sampling Details:	Coal Sample As-Received Basis		
Method of Testing:	As per IS:1350(P-I), IS:1350(P-II), IS:1350(P-III), ASTM D5373 & ASTM D6349		

TEST REPORT

Sr. No.	Test Parameters	UoM	Results
1	Proximate Analysis		
i	Total Moisture	%	13.82
ii	Ash	%	35.90
iii	Volatile Matter	%	21.54
iv	Fixed Carbon	%	27.55
2	Ultimate Analysis		
iv	Sulphur	%	0.37
3	Calorific Value Analysis		
i	Gross Calorific Value	Kcal/Kg	3585
4	Heavy Metal Analysis		
i	Arsenic	mg/kg	1.60
ii	Mercury	mg/kg	0.20
iii	Cadmium	mg/kg	0.35
iv	Zinc	mg/kg	7.86
V	Cobalt	mg/kg	4.48
vi	Lead	mg/kg	3.08
Vii	Titanium	mg/kg	4.36
viii	Aluminum	mg/kg	5.72

Results relate only to the sample tested.

Remarks: Proximate & Ultimate, and GCV analysis tested as received basis.

Name and Designation of Authorized Signatory

Dr. SubbaReddy Mallampati
Manager - Environment.

Vimta Labs Limited

Registered Office
142, IDA Phase II, Cherlapally
Hyderabad-500 051, Telangana, India
T : +91 40 2726 4141
F : +91 40 2726 3657

ISSUED TO:

M/S. KSK MAHANADHI POWER COMPANY LTD,
NARIYARA VILLAGE,
AKALTARA TEHSIL,
JANJGIR-CHAMPA DISTRICT
CHHATTISGARH,

Report Number : VLL/VLS/24/12035/001
Issue Date : 2024.10.03
P.O. Number : 2019-20/MHKB/HO/KMPCL/
VILL/AMEND/2026-5
P.O. Date : 30.04.2024

Page 1 of 1

Customer Provided Details:			
Sample Name:	Coal Sample		
Test Required:	Proximate Analysis, Ultimate and GCV Analysis		
Lab Provided Details:			
Sampling Date:	2024.09.20	Sample Registration Date:	2024.09.23
Analysis Starting Date:	2024.09.23	Analysis Completion Date:	2024.10.01
Quantity Received:	~100 gm X 1 No.		
Sampling Details:	Coal Sample Air Dried Basis		
Method of Testing:	As per IS:1350(P-I), IS:1350(P-II), IS:1350(P-III), ASTM D5373		

TEST REPORT

Sr. No.	Test Parameters	UoM	Results
1	Proximate Analysis		
i	Total Moisture	%	4.90
ii	Ash	%	35.91
iii	Volatile Matter	%	23.77
iv	Fixed Carbon	%	30.41
2	Ultimate Analysis		
iv	Sulphur	%	0.40
3	Calorific Value Analysis		
i	Gross Calorific Value	Kcal/Kg	3957

Results relate only to the sample tested.

Remarks: Proximate & Ultimate, and GCV analysis tested as received basis.

Name and Designation of Authorized Signatory



Dr. SubbaReddy Mallampati
Manager - Environment.

Annexure-XXIX

Unit Wise Status of progress of FGD installation to control SO_x emission to comply with the emissions standards notified by the MoEF&CC on 7th December 2015, stipulating norms for PM, SO_x, NO_x, Mercury and Water.

1. Name of the thermal power plant and capacity: KSK Mahanadi Power Company Limited, Nariyara, JanjgirChampa District, Chhattisgarh– (capacity 6x600 MW)

SN.	Unit no.	Capacity	Applicable SO ₂ norms (100, 200 or 600 mg/Nm ³)	FGD Technology selected	Time line as per MOEF & CC notification 31.03.2021	Feasibility Study completed	Tender Specification made	NIT issued	Bid Opened	Bid Awarded	Construction progress (%)	Remarks/pre sent status
1	III	600 MW	200	Wet lime stone based FGD	31.12.2026	1.5.2019	3.7.2020	31.01.20	Yet to complete job	Yet to award	0%	Plant under NCLT. Technical bids floated and yet to complete process identification of EPC contractor
2	IV	600 MW	200	Wet lime stone based FGD	31.12.2026	1.5.2019	3.7.2020	31.01.20	Yet to complete job	Yet to award	0%	Plant under NCLT. Technical bids floated and yet to complete process identification of EPC contractor Technical bids floated and yet to complete process identification of EPC contractor
3	II	600 MW	100	Wet lime stone based FGD	31.12.2026	1.5.2019	Made	31.01.20	Yet to complete job	Yet to award	0%	Plant under NCLT. Technical bids floated and yet to complete process identification of EPC contractor

FGD SYSTEM-PLANT LAYOUT WITH ABSORBER UNITS



[illegible]

Place : New Delhi
 Dated : 29th January, 2020

Harsh Pali Singhania
 (Vice Chairman & Managing Director)

Multipurpose office papers from JK Paper

Admin Office: Nehru House 3rd Floor, 4, Bahadur Shah Zafar Marg, New Delhi-110002, Ph: 91-11-33001132, 33001112, Fax: 91-11-23712660
Regd. Office: Central Pulis Mills, Fort Sonpach, Dist. Tapi, Gujarat - 394660. Website: www.jkpaper.com
Corporate Identity Number: L21101GJ196DP.LCC18099 • jkaparindia • [jkaparindia](https://www.facebook.com/jkaparindia)

पुर्न्या, नई दिल्ली के असीम इन्फ्रान्स्ट्रक्चर्स अफाफ किम्बा है (या संदेश है कि उसने किया है) और उस पर लगी शिए गगु निगरानी काट कर यह शिख कर सोटा दिया गया है कि उक्त गगु नीली साल बुज स्व. भी बंदु राम मिल गही रहा है और मुझे समाधान रूप कर में दर्शित कर दिया गया है कि उक्त नीली साल बुज स्व. भी बंदु राम कवार हो गया है (या उक्त वाचर की लागी से बचने के लिए कपाने आगयी दिया रहा है)

इसलिए इसने द्वारा उद्यमोपग की जागी है कि **FIR No. 344/2018 U/s 33 Delhi Ex. Act** के उक्त अधीकृत में भी साल बुज स्व. भी बंदु राम से असा की जागी है कि वह इस ब्यासाल के समत उक्त कवार का चरर देने के लिए दिनांक 12.03.2020 तक का इससे पहले दखिर हो।

आदेशानुसार

DP/899/N/20-20 श्री हरजीत सिंह जसपाल, पृथग-09
Court matter कचरा नं. 288, तीस हजार की कोर्ट, दिल्ली

1300mm dia pipeline from WTP to Thane MBR pipeline.
Estimated Cost: Rs. 91,44,154/-
E-Tender documents available on <https://item.abcpocure.com> from 27.01.2020 to 28.02.2020 upto 15:00 hrs.
Sd/-
Managing Director

KSK Mahanadi Power Company Limited
 (Under Corporate Insolvency Resolution Process)
 8-2-293/2A/431/A, Road No. 22, Jubilee Hills,
 Hyderabad - 500033, India. Website: www.ksk.co.in

International Competitive Bidding (ICB) – Flue Gas Desulfurization (FGD) system
 (Wet Limestone or Ammonia based technology) and its auxiliary facilities

KSK Mahanadi Power Company Limited (Owner) intends to supply "Flue Gas Desulfurization system" (Wet Limestone or Ammonia based system) for its 3 x 600 MW Coal based Thermal Power plant located at village Nalgur, Jangir-Champa District, Chhattisgarh, India.

The Owner invites sealed bids through ICB mode from eligible bidders, for the FGD system based on one or both the technologies, on EPC basis.

Interested bidders may submit their bids and are advised to download the "Pre-qualification Requirements" from our website or send request to e-mail: acharya.nm@ksk.co.in or ICB process Schedule.

Expression of interest publication: 31.01.2020 **Pre-bid conference at: 18.02.2020**
Finalization of Bids: 04.02.2020 **Submission of Technical Bid: 11.02.2020**

Owner reserves the right to reject any or all bids or cancel the bidding process without assigning any reason, whatsoever. Owner shall not be liable for any amount in case of rejection of any bid or cancellation of bidding process at any time.

Sd/-
Interim Resolution Professional of KSK Mahanadi Power Company Limited
Reg. No.: BB/PPA-401/P-0663/3-2015-2017-15966

[illegible]

New Delhi: In a relief for farmers, the weather office on Friday forecast normal monsoon rainfall in the range of 94% to 106% of long period average (LPA) in the country as a whole in July, which may co-

ver the deficit in June.

This is expected to accelerate the sowing of kharif crops such as paddy, maize and pulses.

While monsoon covered most parts of

the country rapidly in the last week of June arriving early in several northern states, several areas in the core agricultural zone received scanty rainfall, delaying sowing of kharif crops and increasing fe-

ar of productivity loss

The India Meteorological Department (IMD) in its forecast for July said most areas in central India, adjoining south peninsula, eastern India, and some parts of Northeast and Northwest India will receive normal rainfall during the month.

Some areas such as eastern Uttar Pradesh, some parts of Bihar, Jharkhand, Tamil Nadu, West Bengal, Karnataka and Andhra Pradesh are likely to get below-normal rainfall, it said.

Till June 29, 14 states including Maharashtra, Telangana, Bihar, Jharkhand, Kerala, Uttar Pradesh, Andhra Pradesh, Karnataka, and Odisha had deficient rainfall.

The deficit in Maharashtra, Telangana, and Kerala is expected to be covered in July. Other states such as Bihar, Jharkhand, Tamil Nadu, West Bengal, Karnataka and Andhra Pradesh may still get below normal rainfall, the weather office said.

There is also a high probability for the development of El Niño conditions over the equatorial Pacific Ocean and positive Indian Ocean Dipole (IOD) conditions over the Indian Ocean during July to September 2023, IMD said. — **Our Bureau**

E-Auction Notice

Senior Divisional Commercial Manager, Lucknow on the behalf of The President of India invites through E-Auction system for Publicity Digital LED Screen/Digital/Video wall through (Advertising on station premises Digital) for 05 years, Details are as under-

S.N. : 1, Lot No./Category :
ADVT-LJN-LJN-OSD-121-23-1,
Description : Publicity Digital LED
 Screen Digital/Video Wall, **Station :**
 Lucknow, **Tentative Location**
Description (size) : Infront of station
 cashier office building circulating area
 (16 Foot x 8 Foot) 128 sq.ft., **Unit :** 1,
Date and Time of Close of Auction :
 Dt. 07.07.23 at 12:30 hrs. **S.N. : 2, Lot**
No./Category : ADVT-LJN-G-121-23-1,
 115-23-1, **Description :** Publicity LED
 Screen-Digital/Video, **Station :** Gonda,
Tentative Location Description (size)
 : Circulating area (16 Foot x 8 Foot)
 128 sq.ft., **Unit :** 1, **Date and Time of**
Close of Auction : Dt. 07.07.23 at 12:40
 hrs., **Contract Period :** 05 years,
Websites Address : www.ireps.gov.in
 (E-auction module), **Date and Time of**
Auction Start (all lots) : 07.07.2023

Tender Notice No. ELCONKGP-YABLS-GEN-23-06, dated : 06.06.2023. Divisional Electrical Engineer
South Eastern Railway, Kolkata

Following tender has been uploaded on website www.ireps.gov.in The e-tender will be closed at 12.00 hrs. on due date.

Brief Description of Works : Power supply augmentation, Electrification & modification of Electrical General service works from Narayangarh (ex-Balasarai cabin) in connection with the work of double line between Narayangarh and Nadak in Kharagpur division of South Eastern Railway. **Cost :** Rs. 4.89,48,341/-. **Bid Security :** Rs. 3,94,800/-. **Completion Period :** 15 months. **Due date :** 24.07.2023. Interested tenderers may visit website www.reps.gov.in [E-Tender] or www.reps.gov.in/works to View tender details. For REGISTRATION->IR-Electrical->SOUTH EASTERN RLY/DYCEE-C-KGP-ELECTRIFICATION[L] for full details/description/specification of the tenders and submit their bids online. In no case manual bids for these items will be accepted. **B :** Prospective Bidders may regularly visit www.reps.gov.in to participate in other tenders. (PR-350)

 GOVERNMENT OF HARYANA		TENDER NOTICE 				
SR. No.	NAME OF BOARD / CORP. / AUTH	NAME OF WORK / TENDER	OPENING DATE CLOSING DATE (TIME)	AMOUNT / (APPROX.) IN RUPEES	WEBSITE OF THE BOARD CORP. / AUTH	NODAL OFFICER / CONTACT DETAILS / EMAIL
1.	UHBVN	SUPPLY OF MATERIAL, ERECTION, TESTING AND COMMISSIONING/ AUGMENTATION OF EXISTING 36 NO. 33 KV SUB-STATIONS WITH CREATION OF NEW 33 KV LINES AND AUGMENTATION OF EXISTING 33 KV LINES ALONG WITH CIVIL WORKS ON TURNKEY BASIS UNDER OPERATION CIRCLE KARNAL, KURUKSHETRA, KATHAL, SONEHAT, BHINDAR AND BHAGPUR UNDER THE JURISDICTION OF UHBVN	20.07.2023 24.07.2023	10 LACS	www.uhbvn.org.in NET-345 / P&T/ 2023-24 (B-697)	01722579431 cpd@uqbvn.org.in

FOR FURTHER INFORMATION KINDLY VISIT : www.haryanaapcurement.gov.in or www.etenders.hry.nic.in RO 19046

 **KSK Mahanadi Power Company Limited**
(under Corporate Insolvency Resolution Process)
8-2-293/82/A/431/A, Road No. 22, Jubilee Hills,
Hyderabad – 500033, India. Website: www.ksk.co.in

International Competitive Bidding (ICB) – Flue Gas Desulfurization (FGD) system
== (Wet Limestone based technology) and its auxiliary facilities ==

KSK Mahanadi Power Company Limited (Owner) intends to set-up 'Flue Gas Desulfurization system' (Wet Limestone based system) for its 3 x 600 MW Coal Based Thermal Power plant located at village Nanyara, Jangir-Champa District, Chhattisgarh, India.

The Owner invites sealed bids through ICB mode from eligible bidders, for the FGD system based on Wet Limestone based technology, on EPC basis.

Interested bidders may submit their bids and are advised to download the 'Pre-Qualification Requirements' from our website or send request to e-mail: envsksk@ksk.co.in

Also download from: www.ksk.co.in/kmpcd/fgd.html

ICB process Schedule:

Expression of interest publication	: 1.07.2023	Issue of tender specification	: 17.07.2023
Submission of Techno-commercial bids	: 09.09.2023	Selection of FGD bidder	: 21.10.2023

Owner reserves the right to reject any or all offers or cancel the bidding process without assigning any reason, whatsoever. Owner shall not be liable on any account in case of rejection of any bid or cancellation of bidding process at any time.


Resolution Professional of KSK Mahanadi Power Company Limited
Reqn. No.: IBB/I/PA-001/JP-P00033/2016-2017/10096

MALEGAON MUNICIPAL CORPORATION, MALEGAON
Dist Nashik, Maharashtra State
Corrigendum No. 02
E-Tender Notice No.WS/Jal-Mal/01/2023-24

Malegaon Municipal Corporation invites the E-tender for the work of Underground Drainage (Phase-II) Scheme for Malegaon City Under AMRUT 2.0 ABHIYAN, Tal-Malegaon Dist-Nashik. In the State of Maharashtra, Cost of the Work Rs.419,00,28,931/- The e-tender is being invited till 11/07/2023. For this, the deadline for sale and submission of tender form is being extended till 11/07/2023. The tender holders should take note of this and complete the proceedings. for details visit website <http://www.mahatenders.gov.in/> and will be available

COMMISSIONER
Malegaon Municipal Corporation, Malegaon

KERALA WATER AUTHORITY e-Tender Notice
Tender No : 1st Re E tender No. WRD / KWACE (SR) / TR / 6150 /
2022_26_1_1/1, 1st Re E tender No. WRD / KWACE (SR) / TR / 6902 /
2022_26_5_4/1. J.M - Works of (1) Erumeli Package 6, (2) Thalappalam
reservoir, (3) Kottayam District reservoir, (4) Construction of Service
reservoir, laying of distribution network and providing FHTC. EMD : Rs.
5,00,000/- each. Tender fee : Rs. 16540 +2978) GSTN each. Last Date
for submitting Tender : 12-07-2023 03:00 pm. Phone : 0481 2562745.
Website: www.kwa.keralagov.in & www.etenders.keralagov.in.
KWA-MRGL-570-2023-27 Superintending Engineer, PH Circle, Kottavam

 **PSPCL Punjab State Power Corporation Limited**
(Regd. Office PSEB Head Office, The Mall, Patiala-147001)
Corporate Identity Number : U40109PB2010SGC033813
Website : www.pspcl.in Mobile No 96461-10914

E-Tender Enq. No. 7434/P-1/EMP-12365 dated: 26.06.2023
Dy. Chief Engineer/Headquarter (Procurement Cell-1)
GGSSTP, Roopnagar invites E-Tender ID No. 2023 POWER_104786_1 for Procurement of HH Group (Hose Pipes) For detailed NIT & Tender Specification please refer to <https://eproc.punjab.gov.in> from 28.06.2023/02.00 PM onwards.

Note :- Corrigendum & addendum, if any will be published online at <https://eproc.punjab.gov.in>

RTP-76/23, DPR/Ph: 76155(12/18566/2023/25460)



Markfed PUNJAB

A House Of Quality Food Products



Short Term Tender Notice

Reference No.: Marketing/2023/ 4187 Dated : 30.6.23

The Punjab State Cooperative Supply and Marketing Federation Limited (Markfed) invites e-tender for purchase of pulses as detailed below :

S. No.	Pulses	Qty
1.	Mah Whole	70 MT
2.	Dal Chana	25 MT
3.	Black Chana	25 MT
4.	Sabut Masur	50 MT
5.	Moong Whole	50 MT
6.	Rajmah Chitra	5 MT
7.	Dal Moong (Dhuli)	5 MT
8.	Dal Masur Dhuli	5 MT
9.	White Chana	5 MT
10.	Dal Arhar	2 MT

Closing date & Time : 7.7.23 upto 11.00 AM

Date of Opening of Tender : 7.7.23 at 2.00 PM

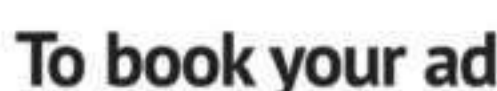
For detail of terms & Conditions - log on to www.markfedpunjab.com & eproc.punjab.gov.in

Note : Any corrigendum to the Tender Notice shall be published on website www.markfedpunjab.com & eproc.punjab.gov.in

MANAGING DIRECTOR
MARKFED CHANDIGARH

MODERN COACH FACTORY, RAEBARELI				
E-Advised Tender Notice No. 41/ET/2023-24				Dated: 27.06.2023
SN	Tender No.	Short Description	Qty.	Due Date
01	06231024	Supply and Application of PU Paint.	817 Set	24.07.2023
02	04231119	One Rake Set of Automatic Sliding Door For Trainset Coaches.	10 Set	21.07.2023
03	05231151	EXT SUPP Socket 125 AMP/415V IP67, 5POLE (3P+N+E) With Pilot Contacts.	3142 Nos	27.07.2023
04	21131130	Set of LAV, SIDE Wall for LWSCN Coach.	191 Set	24.07.2023
05	03231224	Water Tank Assembly L/H	248 Nos	08.08.2023
		Water Tank Assembly R/H.	254 Nos	
06	03231418	Composite Decorative Glass Fabric Rein x forced Plastic (DGFRP) Sheet Size 1220 x 2440 in 3MM Thickness.	6214 Nos	18.07.2023
07	03231500	Snack Table With Bottle Holder (Colour Shade-Blue) for LHB AC2T & AC3T Coaches.	8562 Nos	26.07.2023
08	03231520	Lavatory Floor Complete for LHB SCN (Shell LHB ON ICF Bogie Coaches)	633 Nos	28.07.2023
		Lavatory Floor Complete Euro TYPE (Shell LHB ON ICF Bogie Coaches).	561 Nos	

CURRICULUM			
01/30/EOT/2023-24 Dated: 24.05.2023	Tender No. 05231073	Due date may be read as 15.07.2023 Instead of 28.06.2023	
Website Address: www.irps.gov.in and www.mcf.indianrailways.gov.in By. Chief Materials Manager/Shop			
Tender No.: FireAlarm-Inst-2023-01		Closing Date : 14.07.2023	
Dy. Chief Mechanical Engineer/M&P, Modern Coach Factory, Raebareilly, for and on behalf of president of India, invites ONLINE open tender based on single packet system from reputed firms through Indian Railways portal www.irps.gov.in for tender notice no FireAlarm-Inst-2023-01 , Closing Date 14.07.2023 on prescribed format for the under mentioned work - Description of work : Supply, Installation & Commissioning of Fire Alarm Cable and Shifting of fire alarm panel from data centre of main Admin Building to Fire Station at MCF/RBL through open tender, Approx. Value (in Rs.) : Rs. 57.01,93,700 (Rs. Fifty Seven Lakh One Thousand Nine Hundred Thirty Seven only) Cost of Tender document: NIL (As Per GCC for Works April 2022, Para-03 Of Credentials Of Contractors), Security Deposit Earnest Money : Rs. 1,14,00,000 (One Lakh Fourteen Thousand rupees Only) - Date and Time of closing of tender-14.07.2023 at 15:30 hrs. - Detailed Tender Notice, Eligibility criteria, Terms & conditions are available in tender document at Indian Railways portal: www.irps.gov.in			
Website Address: www.irps.gov.in and www.mcf.indianrailways.gov.in By. Chief Mechanical Engineer/Safety			
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I, Manulla Khatoon M/O Aslam Ansari resident of Village/ Post- Bikhampur, District – Siwan, Bihar have changed my Name from Manulla Khatoon to Maimul Nesha vide Affidavit dated 19/06/2023 before Notary New Delhi.

I, Amita Chakraborty D/O Sri Gita Chakraborty R/O 57 Ganga Floor, Sector 14, Conclave, Delhi-110092 have changed my name to Ranja Chakraborty.

I, Lalita Devi W/O Dew Kumar R/O H.No. 1002 / KH. No. 152 / G-8/2, Santa Vihar, Mukundpur Extn. Delhi have changed my name to Sunita Devi for all purposes.

I, Shubham S/O, Pradeep Maheshwari R/O E-22, Gal Noli 1, Nartha Park, North Delhi Delhi-110084 have changed my name to Shubham Maheshwari

I, Lakhania D/O, Maheshwari Deen R/O 06 2nd Floor, Sukdev Vihar, South Delhi 110025 My father's name is spelled wrong (MAHESVARI DEEN SAHU), correct name is MAHESHWARI DEEN

I, S.No. 15849741N Rank-LD Vijay Kumar S/O Virender Singh R/O RZP-2/55A, New Roshan Park, Najafgarh New Delhi unit-63, CAV C/O 36 A/P/O have declared that my wife name Manju Devi is wrongly mentioned in husband Army record book, correct name is Manju Kumari.

I, Ashesh S/O Surendra Kumar Sinha(S K Sinha) R/O Flat No-85, Goodwill Apartments, Sec-13, Rohini, Delhi-110085 have changed my name from Ashesh to Ashesh Sinha for all future purposes.

I. Nauman Hakim Hashmi/R/O E-679/TB, Sangam Vihar, ND-80 inform my father and mother name wrongly mentioned as Md Hakimuddin Hashmi and Zafrin Hakim Hashmi in my educational documents. Correct name are Hakimuddin Hashmi and Jafroon Nisha.

I. Manoj Kumar S/O. Shyam Sunder Bansal R/O W-6/48-A Street No-8 Behind Canal Bank Uttam Nagar West Delhi Delhi-110059 have changed my name to Manoj Kumar Bansal

I. Rishabh S/O Sh. Ramkishor, R/O Apartment No. FW 10B, 10th floor, Tower FW 19 M3M Golf Estate Gurgaon, Sec-46, Badshahpur, Gurgaon, ND-80 have changed my name to Rishabh Aggarwal for all purposes.

I. ARUSHI Thakur D/O Rajinder Kumar Rathore R/O Q-9, Extn. New Palam Vihar, Phase I, Gurgaon, Haryana-122017 declare that name of mine & my Father is wrongly written as Ruchi Thakur & Rajinder Rathore in my Class 10th & 12th Educational Documents. Actual name of mine & my Father is Arushi Thakur & Rajinder Kumar

I. Indu Rani W/o Manoj Kumar R/O H.No. 237/7, 24 Feet Road, Adarsh Nagar, Malerna Road, Ballabgarh, Haryana, H/21004 have changed my daughter name from Nitya to Nitya Prajapati for all purposes.

I. Akanksha Mittal W/O Abhishek Jain R/O 25/17, East Patel Nagar, Patel Nagar, Delhi-110008 have changed my name to Akanksha Jain for all purposes

I. Ritu Choudhary, W/o Kapil Choudhary T/O Q9, 3rd Floor, Near Chor Minar, New Delhi-110015 have changed my name from Ritu Choudhary to Ritu Chaudhry.

I. Bipin Kumar S/O Rajendra mandal R/O Kh 177, Akarpur, Bikaner, Rajasthan, India, Vija nagar UP 201009 have changed my name to Bipen kumar for all purposes

I. Ashutosh Nareesh Gool S/O Nareesh Gool R/O House No.-9, Block -A, Kc, First Floor, Sector-14, Gurgaon, Haryana have changed my name from Ashutosh Nareesh Gool to Ashutosh Gool for all purposes.

I. Madhav Choudhary, S/o Kapil Choudhary R/O Q9, 3rd Floor, Near Chor Minar, New Delhi-110016, have changed my name from Madhav Choudhary to Madhav Chaudhary.

LOST & FOUND

IT is notified that I, Amita Malik W/O Akash Malik have lost Original Sale Deed of Plot No.- C-176, Kharsa No. 697, Sharad City Colony, Lotus Ghaziabad, U.P. in favor of Smt. Penjeevara Rawat W/O Sh. Jawsant Rawat R/O C-230, Lawrence Road, Delhi 110059 Which was executed by the Director of M/s Siddheshwar Builder Delhi formally Mahamaya Builder Delhi Mr. R.K. Agarwal S/O Shri M. L. Aggarwal in favor of Smt. Penjeevara Rawat W/O Sh. Jawsant Rawat, Ad Book No. 1 in Page No. 174/177 of Volume No. 1098 No. 12733, was registered on 17.12.1998 an FIR No. 586496/2023 finder PI contact 998014014

WE, Jyotsna Grover and Lata Grover, have not paid the payment Receipts INR 2,43,000/- (04/01/2006), INR 1,75,000/- (07/09/2005), INR 10,00,000/- (03/03/2005) INR 6,75,000/- (01/04/2005), INR 10,00,000/- (05/04/2005), INR 2,58,000/- (05/01/2005) of C-16, 2nd Floor, Ardee City, Sector 52, Gurgaon # 98989855754

RELINQUISHMENT Deed Certificate No IN-DL5013973144888P Dated 07 Nov 2019 by Anita Barua Favouring Umesh Kumar Arora, Satish Kumar Arora & Krishan Kumar Arora for E 96 Ashok Vihar Phase 1 Delhi 52 Lost on 02 June 2023 in Delhi

I, Ved Prakash Chandra S/o Jaggi R/o H. No. 31-A, Market No. 1, Block-C, Ramleela Colony, N.P. Faridabad, Haryana have lost my original Form of Attorney Reg. No. 234 of 14.08.2020 sub registrar Dehradun, my chain of Transfer Deed Regd. No. 9351 dt. 04.03.2020 sub registrar Badkhal. Finder may contact above address.

To be known to all, I, Mr. Sudershan Jain S/o Jai Prakash Jain, and Mrs. Babita Jain W/o Mr. Sudershan Jain both are R/o Block -BQ -99, Shalimar Bagh, Delhi-110088 have lost my Original Property Document viz: Original Allotment Letter, Handing Over Possession Letter and Site Possession letter issued by DDA in respect of the Property Block -BQ -99, Shalimar Bagh, Delhi-110088. An NCR to this effect has been lodged vide LR No. 60750/2023 dated 12/06/2023. Finder please Contact: 9350009712

Readers are recommended to seek appropriate enquires and seek appropriate advice before sending money, incurring expenses, acting on medical recommendations or entering into any commitment in relation to any advertisement published in this publication. The Times of India Group doesn't vouch for any claims made by the Advertisers of products or services. The Publisher, Editor, and Owners of The Times of India Group are not liable for any consequences that ensue from such claims as are not honoured by the Advertisers.

Mishra R/o Flat No. 702, Kailash Flats, G Block, East Of Kailash, New Delhi - 110065 have changed my name to Anamika Mishra for all purposes.

I, Neeraj Kumari w/o Abhinandan r/o M/ Twisha R/o H. No. 259, Koko Bagri, Karalga, Delhi-110081 have changed my minor daughter's name from Twisha to Twisha Mathur for all purposes.

I Meenakshi Sharma D/O Rajender Sharma R/O 9/9/9, Railway Colony, Sewa Nagar, New Delhi 110003 Have changed my name from Minakshi Sharma or Meenashi Sharma or Meenashi Sharma. To Meenakshi Sharma for all future purposes.

I Sanjeev Khandelwal S/O Kishan Lal Khandelwal R/o House No.23,5,f.pocket 3,sector 21,rohini,delh1 110086 have changed my name to Sanjeev Kumar Khandelwal

I, Dheeraj Kumar Gupta S/o Balkrishn Bansal R/O T-184 shukkar bazar, Uttam nagar, ND-59, inform that my parents name is wrongly written in my Documents I.e Balkrishn Gupta and Prem Lata which is to be Balkrishn Bansal and Prem Lata Bansal

Sandhya W/o Raju Kumar Singh, R/o RC-51, Adarsh Nagar, Vishw Nath Colony Ghazi colony, Indrapuram Khajalabad, UP-200114, have changed my name to Rajni Singh.

I, Jawad Anwar S/o Mohd. Anwarul Haque R/o A-487, Gali No.-1, Prem Nagar-3, Gourav Nagar, Kirari Suleman Nagar, Delhi-110086 have changed my name from Jawad Anwar to Jawaid Anwar for all purposes.

I, Indu Rani W/o Manoj Kumar R/o H.No 237/7, 24 Feet road, Adarsh Nagar, Malena road, Ballabgarh, Faridabad HR-121004 have changed my daughter name from Ghanishka to Ghanishka Prajapati for all purposes

I, Anuradha Devi W/o J.C. 481554K Sub Rabej Singh R/o 5 Rajput regiment, inform that in my Husband Army records my name was written as Anuradha, whereas my correct name is Anuradha Devi.

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Ujwal Discom Assurance Yojna Was Not A Failure: RK Singh

GAINS IN DISTRIBUTION Minister says scheme helped reduce losses of discoms; a new scheme for utilities may be announced in budget

Our Bureau

New Delhi: Power and renewable energy minister RK Singh on Monday said the Ujwal Discom Assurance Yojna (UDAY) was not a failure, as it reduced average commercial losses of distribution companies. He also said a successive scheme for revival of the utilities may be announced in the Union Budget later this week.

"We have discussed the new (UDAY) scheme with finance ministry. We expect it to find a place in the Budget," said Singh on the sidelines of the listing ceremony of the \$750-million international bond of Power Finance Corporation (PFC) on the NSE.

The power minister said all the Central schemes run by his ministry will be clubbed into one scheme, under which distribution companies will have to agree to trajectories to reduce losses to get financial assistance. "UDAY was

One Scheme for All

UDAY WAS NOT A FAILURE. IT REDUCED AVERAGE COMMERCIAL LOSSES TO 18.79% IN FISCAL 2019 AGAINST 22% A YEAR AGO



We have discussed the new (UDAY) scheme with the finmin. We expect it to find a place in the Budget

RK SINGH
Power Minister

not a failure. It reduced average commercial losses to 18.79% in financial year 2019 against 22% a year ago," he said, adding that the government is targeting to reduce commercial losses to 15% with the new scheme.

Singh said financing from Power Finance Corp and REC Ltd will also be revised to give loans to only those discoms that meet the set targets.

ET had on January 17 reported that the government plans a grant of over ₹1.1 lakh crore to state power distribution companies under a new bailout scheme that will mandate discoms with high losses to either privatise operations or appoint distribution franchisees and invest in infrastructure upgradation.

The government expects to spur about ₹3 lakh crore of investments in the distribution sector through the latest discom restructuring scheme that it claims is different from the three previous initiatives.

"The scheme is reform and result-oriented where the distribution companies will invest first and get money later only when they perform," a senior government official had said.

BOX OFFICE COLLECTIONS OF HOLLYWOOD MOVIES CROSS ₹1,000 CR IN 2019

Indians Just Can't Get Enough of Hollywood Blockbusters

Gaurav Laghate & Rajesh N Naidu

Mumbai: Bollywood is getting jostled by Hollywood. The lack of blockbusters from the Khan troika — Aamir, Shah Rukh and Salman — as well as big Hollywood hits led by the Avengers movies has seen Bollywood lose some share of domestic theatrical revenues.

Over the past five years, data from various sources such as EY, BookMyShow, Ormax Media, B&K research and industry estimates show that Hindi films' share on the domestic box office, which used to be 60-65% in 2015, dropped to 45% in 2019. At the same time, the box-office share of Hollywood films, including dubbed versions, has gone up from 8.4% in 2015 to almost 20.8% in 2019, registering a compounded annual growth rate (CAGR) of 27%.

The remaining share is taken up by films in other languages. The last two years — 2018 and 2019 — have been exceptionally good for Hollywood in India as Marvel's Avengers: Infinity War and Avengers: Endgame broke existing box-office records in the country. The total collection of Hollywood films in India was ₹921 crore in 2018 and more than ₹1,220 crore last year.

"Today, watching films in theatres is not just about familiarity of



experience. The desire for familiarity of experience is fulfilled by inordinately high amount of content present across streaming and modes of platforms," said a trade analyst. "Hollywood films not only work in terms of the franchise model but they also demand a certain amount of atmospheric viewing. This is adequately fulfilled in theatres. A case in point is the success of 1917, which has no franchise, but works on sheer strength of experience and storytelling." Given the lineup of upcoming films, the share of Hollywood films in total box-office collections is expected to go up to 25-30% in the next

two to three years, experts said.

This year will see the release of franchise films such as Dolittle, No Time to Die, Black Widow, Legally Bond 3, Fast & Furious 9, Wonder Woman 1984, Top Gun: Maverick, Minions: The Rise of Gru, Jungle Cruise, Snake Eyes and Eternals.

Hollywood's increasing share is positive news for multiplexes, said Rohit Dokania, senior vice president, research, IDFC Securities.

"Hollywood films are doing much better at the box office in India and it's a very positive sign for

the multiplexes, which is now visible in their valuations," he said. "Earlier, they were dependent on Bollywood for almost 65% of their footfalls. Now with increase in Hollywood films, multiplexes' content is being de-risked. Moreover, the profile of consumers watching Hollywood content has a higher propensity to buy F&B, which in turn further helps the multiplexes."

Hollywood studios have invested in dubbing in multiple regional languages in a bid to maximise revenue from India, said Ashish Sak-sena, COO, cinemas, BookMyShow. They're also dubbing them to enable wider viewership, especially for complex, layered films such as Inception, Dunkirk, Joker, Interstellar etc., he said.

"Studios are also investing in genres such as animation that typically didn't perform well here by dubbing across regional languages and marketing these films on a wider scale, aiding audience interest for these niche genres," Sak-sena said.

The advent of streaming and other platforms has increased familiarity with Hollywood as well as the back catalogue, adding to the boost, experts said. Most Hollywood films, big and small, are now released in India at the same time they are premiered globally.

Thane Municipal Corporation, Thane

PUBLIC WORKS DEPARTMENT

Tender Notice

B-2 Type E-tender is invited for work of Resurfacing of Ghodbunder service road (Both service road) from Shaktipith manpada to Nagla bunder STP and Uni Abex Co. to Shivmandir, Gaimukh in Thane Municipal Corporation Area. Detailed tender notice and tender document will be available on websites <https://maha.tenders.gov.in> from dt. 28.01.20 to dt. 24.02.20 up to 16.00 hrs. Tenderer has to be purchase and submit the tender by E-tendering procedure only on or before dt. 24.02.20 up to 16.00 hrs.. Envelope no.1 will be opened on dt. 27.02.20 at 16.30 hrs if possible and Envelope No 2 will be opened on dt. 02.03.20 at 16.30 hrs if possible. TMC/PRO/PWD-HQ/1639/19-20 SD/- Dt.27.01.2020 City Engineer, pls visit our official web-site Thane Municipal Corporation www.thanecity.gov.in

EAST CENTRAL RAILWAY

Corrigendum No.1

e-Tender No. 2019/WP/BND/ENG/WT-12 (Open)
Name of the work with its location : Composite works (Civil, Electrical and Mechanical) involving construction of Industrial Shops with Pre-Engineered Building (PEB), Extension of RCC Box bridge and other ancillary buildings, water supply system, drainage system, track works, road works, Electrification and illumination works, associated telecom works and Supplying & commissioning of specified Mechanical Machineries (EOT cranes etc) in connection with Detachment free rake examination facilities at Exchange Yard of Bondamunda, South Eastern Railway. Description : Date & Time for closing of e-tender: As published earlier : 11.02.2020 at 13.00 Hrs. As revised : 14.02.2020 at 13.00 Hrs. Other terms and conditions will remain unchanged. Corrigendum can be seen on IREPS Website : www.ireps.gov.in CAO/NP Chamber Bhawan, J.C.Road, Patna PR/02115/WP/ENG/C/19-20/32

Govt. of India
Ministry of Home Affairs
Directorate of Census Operations, Jharkhand
JIADA Central Office Building, 2nd Floor,
Industrial Area, Namkum, Ranchi-834010
Phone no. 0651-2460340, 2460170

File No. D-28014/1/2018
Disposal of Census 2011/NPR Documents, Records etc.
Directorate of Census Operations, Jharkhand, Ranchi is inviting bids on 04.02.2020 through MSTC vide auction no. MSTC/RNC/DIRECTORATE OF CENSUS OPERATIONS JHARKHAND/6/RANCHI/19-2034781 (241736) for disposal of Records pertaining to Census 2011 & National Population Register.

In this connection, this Directorate is inviting bids on 04.02.2020 between 11 AM to 15 PM from intending Firms/Agencies/Pulp Mill Mills through MSTC (www.mstcindia.co.in) to dispose of the Census 2011 & NPR Records weighing 170 ton approx. (Sh. Ashutosh Kumar Bisli) Statistical Investigator Grl, DCO Jharkhand, Ranchi.

KSK Mahanadi Power Company Limited
(Under Corporate Insolvency Resolution Process)
8-2-293/82/A/431/A, Road No.22, Jubilee Hills, Hyderabad - 500033, India. Website: www.ksk.co.in

International Competitive Bidding (ICB) - Flue Gas Desulfurization (FGD) system (Wet Limestone or Ammonia based technology) and its auxiliary facilities
KSK Mahanadi Power Company Limited (Owner) intends to set-up 'Flue Gas Desulfurization system' (Wet Limestone or Ammonia based system) for its 3 x 600 MW Coal based Thermal Power plant located at village Nariyara, Janjigir-Champa District, Chhattisgarh, India.

The Owner invites sealed bids through ICB mode from eligible bidders, for the FGD system based on one or both the technologies, on EPC basis. Interested bidders may submit their bids and are advised to download the 'Pre-Qualification Requirements' from our website or send request to e-mail: acharyulu.m@ksk.co.in

ICB process Schedule:
Expression of interest publication : 31.01.2020 Pre-Bid conference at site : 16.02.2020
Finalization of Bidders : 04.02.2020 Submission of Technical Bids : 10.03.2020
Owner reserves the right to reject any or all offers or cancel the bidding process without assigning any reason, whatsoever. Owner shall not be liable on any account in case of rejection of any bid or cancellation of bidding process at any time. Sd/-
Interim Resolution Professional of KSK Mahanadi Power Company Limited
Reg. No.: IBBI/IPA-001/IP-P0003/2016-2017/10086

SBI State Bank of India

STRESSED ASSETS MANAGEMENT BRANCH - I
Authorized Officer's Details :-
Name : Subramanya
e-mail : Subramanya.subramanya@sbi.co.in
Mobile No. : 9620022278
Landline No. (Office) : 022-22177670
Address of the Branch:
The Arcade, 2nd Floor, World Trade Centre, Cuffe Parade, Colaba, Mumbai-400 005, E-mail ID of Branch: sbi.04107@sbi.co.in

E-AUCTION SALE NOTICE Annexure -A
SALE OF MOVABLE & IMMOVABLE ASSETS CHARGED TO THE BANK UNDER THE SECURITISATION AND RECONSTRUCTION OF FINANCIAL ASSETS AND ENFORCEMENT OF SECURITY INTEREST ACT, 2002.
The undersigned as Authorized Officer of State Bank of India has taken over possession of the following properties/ies u/s 13 (4) of the SARFAESI Act. Public at large is informed that e-auction (under SARFAESI Act, 2002) of the charged properties/ies in the below mentioned cases for realisation of Bank's dues will be held on "AS IS WHERE IS BASIS AND AS IS WHAT IS BASIS".

Name of Borrower(s)	GOI Offshore Limited, (Registered Address)-Represented through official Liquidator, High Court Mumbai. Energy House, 81 Dr. D.N.Road, Mumbai-400001.
Name of Guarantor(s)	1) Shri. Prakash Chandra Kapoor, (Guarantor) 46, CCI Chambers, 5th Floor, Dinshaw Wacha Road, Churghate, Mumbai-400 020. 2) Shri. Vijay Kumar (Guarantor) 410/411, Mittal Park, Ruia Park, J.R. Mhatre Road, Juhu, Mumbai-400 049
Outstanding Dues for Recovery of which Properties/ies are Being Sold	Rs. 62.89, 17000 (Rupees Sixty two crores eighty nine lacs seven thousand seven hundred and seventy only) as on 21.07.2018. Interest & costs less subsequent recoveries if any. Demand Notice U/s 13(2) of the SARFAESI Act, 2002 Dated:- 21.07.2018
Name of owner / Title Deed Holders	M/s. GOI Offshore Limited (Previously Known as Great offshore Limited)
Description of Property	Exclusive charge on all that piece and parcels of land bearing CTS No. 1/1494 admeasuring 1103 sq.yds (922.24 sq. mtrs) of the Port Division known as Energy House in the name of Great Offshore Limited situated at 81, Patton Road, Estate Bungalow No.2, Old Saluting D.N. Road, Mumbai 400 001 together with all buildings and other structures, fixtures and fittings constructed, erected or installed thereon or to be constructed erected or installed thereon.
Reserve Price (R.P.)	Rs. 7,44,44 Cr.
Earnest Money Deposit (EMD)	Rs. 7,44,00,000
Bid Increment Amount in multiple of	Bid increment amount Rs. 3,00 Lacs
Date & Times of Inspection	Inspection on 07.02.2020 from 03.00 p. m. to 05.00 p. m.
Date & Time of E-auction	E-auction on 14.02.2020 from 12.00 p. m. to 02.00 p. m.
Date & Time For Submission of Request Letter of Participation / KYC Documents / Proof of EMD Etc.	Last date for EMD Deposit / submission of KYC Documents / Proof of EMD etc. is before close of business on 11.02.2020 RTGS DETAILS FOR DEPOSIT OF EMD :- Bank: State Bank of India IFSC Code: SBIN0004107 Account No.: 10271666136 Beneficiary: R & R Collection Account

E-Auction is being held on "AS IS WHERE IS" and "AS IS WHAT IS BASIS" and will be conducted "On Line". The auction will be conducted through the Bank's approved service provider M/s E Procurement Technologies Ltd. (Auction Tiger) Ahmedabad Contact person Mr. Pushpit 07961200546 e-mail id: pushpit@auctiontiger.net, Mr. VIJAY SHETTY, Mob. No. 09619002431, e-mail id: vijsahetty@auctiontiger.net, at the web portal (<https://sbi.auctiontiger.com>). E-Auction Tender Document containing online e-auction bid form, Declaration, General Terms & Conditions of online auction sale are available in websites- <https://sbi.auctiontiger.net>. To the best of knowledge and information of the Authorised Officer, there is no encumbrance on the property/ies. However, the intending bidders should make their own independent inquiries regarding the encumbrances, title of properties/ies put on auction and claims / rights / dues / affecting the property, prior to submitting their bid. The e-Auction advertisement does not constitute and will not be deemed to constitute any commitment or any representation of the bank. The property is being sold with all the existing and future encumbrances whether known or unknown to the bank. The Authorised Officer/ Secured Creditor shall not be responsible in any way for any third party claims / rights / dues. The sale shall be subject to rules / conditions prescribed under the Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest Act, 2002. The other terms and conditions of the e-auction are published in the following websites.

1. <https://sbi.auctiontiger.net> of E-Procurement Technologies Ltd.
2. <https://www.sbi.co.in> of State Bank of India
Date : 21.01.2020
Place : Mumbai
Sd/-
Authorized Officer,
State Bank of India

Bought into Aptech in '05

From Page 1

Jhunjhunwala, along with his lawyers, told the investigating officer that he was representing his family.

Jhunjhunwala's sister, Sudha Gupta, was called for questioning on January 23. Ushma Sheth Sule, sister of Rare Enterprises CEO and Aptech director Utpal Sheth, has been asked to appear for questioning on January 28. Rare Enterprises is Jhunjhunwala's asset management firm.

Jhunjhunwala, often referred to as India's Warren Buffett for his ace stock-picking skills, is one of the country's richest individual investors, holding shares worth almost ₹1,140 crore, according to Bloomberg estimates. He first bought into Aptech in 2005 at ₹56 a share. Since then, his stake — along with his family members — has risen to 49% with a market value of ₹690 crore based on Aptech's clo-

sing price of ₹173 on the BSE on Monday. Aptech is Jhunjhunwala's only investment where he wields management control.

In response to an emailed query, Jhunjhunwala's office called to say that he and his wife had "no comments" to offer. His brother Rajesh Kumar, in an emailed response, also said he had no comments to make. Sushiladevi Gupta, Ramesh Daman, Madhu Jayakumar, Sudha Gupta, Ushma Sheth Sule, Aptech and Sebi didn't respond to emailed queries.

Also summoned by Sebi on January 20 were Rare Enterprises' employee Amit Shah and Geojit Financial Services' Satish Anam. Shah and Anam didn't respond to queries. Geojit's role in the affair is not clear as of yet. This is not the first time Jhunjhunwala has come under Sebi's scanner: It had questioned him in 2018 for suspected insider trading in Geometric, which is now a part of HCL Technologies. Jhunjhunwala later settled the case through consent by paying ₹2.48 lakh. Consent is a mechanism through which alleged violations can be settled by paying a fee to Sebi without admission or denial of guilt.

'Union Budget May have Measures to Boost Demand'

Mumbai: Finance minister Nirmala Sitharaman's first full year Budget is expected to provide short-term stimulants to boost consumer demand, and such measures will get a positive response from markets, an American brokerage report said on Monday. If the government fails to take the necessary measures, the current cyclical growth slowdown can turn into a structural one, analysts at Bank of America Securities said.

Sitharaman will place the budget proposals on Saturday and all eyes are set on the government, which is likely to announce measures to revive the economic growth that may slide to a decadal low of 5% for FY20.

"Social spends are essential for the long term, but a short-term demand stimulus may be needed to prevent a cyclical slowdown from turning into something structural. In the whole budgeting exercise, the last is a choice we think the government could realistically make," the BoFA report said.

"These would include changes to the long-term capital gains tax framework to reduce tax liabilities, reduction in securities transaction tax and dividend distribution tax, the report added. — PTI

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Facilitation of Water Charges bills Payments for Consumers !

Good News for Mumbaikars !

Municipal Corporation of Greater Mumbai has introduced SBI VAN services (Virtual Account Number) for citizens for making online payment of Water Charges Bills through NEFT, RTGS and CBS (Core Banking System) mode w.e.f. 21.01.2020 onwards. Therefore all Water Connection holders are required to map their new 16 digit Account number in place of 20 digits old account number mentioned on the water bill before making any payment after 21.01.2020.

	Old	New
For. Example Account Number	BMCW000000CCN Number	MCGMWCCCN Number
IFSC	SBIN0COLLEC	SBIN0000300

The said services are free of cost for all SBI customers. Also as per RBI notification no. RBI/2019-20/116, all member banks shall not levy any charges from their saving bank account holders for funds transfer done through NEFT system which are initiated online. All citizens are hereby informed to avail maximum benefit of MCGM's online facility.

PRO/1849/ADV/2019-20

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Canara Bank

Canara Bank invites RFPs for "RFP 18/2019-20 dated 24/01/2020 for Supply, Installation, Implementation and Maintenance of IT Assets and Vendor Management Solution in Canara Bank".

The details are published in the Bank's Website: <http://www.canarabank.com/english/announcements/tenders> and CPPP Website: <https://eprocure.gov.in/epublish/app>. Interested parties may respond. Amendments will be hosted in our website only.
DEPUTY GENERAL MANAGER

2nd SALE NOTICE
KAMINENI STEEL & POWER INDIA PRIVATE LIMITED
(In Liquidation)
Regd Office: "KAMINENI", 4th Floor, King Koti, Hyderabad, Telangana-500001.
Liquidator's Address: T-202, Technopolis, 1-10-74/B, Above Ratnadeep Super Market, Chikoti Gardens, Begumpet, Hyderabad-500016.

E-AUCTION

UNDER INSOLVENCY AND BANKRUPTCY CODE, 2016
Sale of the company M/s Kamineni Steel & Power India Private Limited (In Liquidation) ("Company"), as a going concern, by the Liquidator, appointed by the Hon'ble National Company Law Tribunal (NCLT), Hyderabad Bench, vide Order Dated 26.10.2018 under Regulation 32(e) of the Insolvency and Bankruptcy Board of India (Liquidation Process) Regulations, 2016.

Interested applicants may refer to the COMPLETE E-AUCTION PROCESS INFORMATION DOCUMENT containing details of terms and conditions of online E-Auction, E-Auction bid form, Eligibility Criteria, Declaration by bidders, process participation fee, etc., available at company Website <https://www.kaminenisteelpower.com>. The Auction Sale will be conducted through the E-Auction platform <http://ncltauction.auctiontiger.net>.

Description	Manner of sale	Inspection Date	Date and Time of Auction	Reserve Price INR	EMD Amount Submission Deadline	Bid Increase Amount
Company as a whole	As a going concern	21st February 2020	29th February 2020 from 11.30 am to 3.30 pm	Rs. 460 crores	24th February 2020	Rs.5 lakhs

For E-Auction details, contact Mr. Tilak Maratha (+91-6351896834/079-61200586), Ms. Neha Gyani (079-61200574) or Liquidator. E-Mail: neha.gyani@auctiontiger.net, tilak.maratha@auctiontiger.net

Date: 27.01.2020 CS R. Ramakrishna Gupta, Liquidator
Place Hyderabad
IBBI Reg No.: IBBI/IPA-002/IP- N00012/2016-17/10029
Email: rp.ramakrishnagupta@gmail.com

VAISHAL PATILPUTRA DUGDH UTPADAK SAHKARI SANGH LIMITED

PATNA DAIRY PROJECT
Feeder Balancing Dairy Complex, Phulwarsharif, Patna, 801505
Phones: 2252553, 2252542, 2251622, Fax: 0612- 2250 325, E-Mail - vpmunin@gmail.com

NOTICE INVITING e-TENDER (NIT)

(Through e-tendering mode only on website- www.eproc.bihar.gov.in)
NIT No: VPMU: Engg: 6454 Date : 25-01-2020

(Through e-tendering mode only on website www.eproc.bihar.gov.in)
 Date : 25-01-2020

NIT No: VPMU: Engg: 6454

1.	Name & address of advertiser	Managing Director, Vaishal Patilputra Dugdh Utpadak Sahkari Sangh Ltd (Patna Dairy Project), Feeder Balancing Dairy Complex, Patna -801505				
2.	Date of issue of e-tender notice	29-01-2020 (Wednesday)				
3.	Period for downloading of e-tender document	From 01-02-2020 (Saturday) to 22-02-2020 (Saturday) up to 15.00 hours through above Website.				
4.	Date, Time & Place of pre bid Meeting	07-02-2020 (Friday) at 11.00 AM at VPMU (Patna dairy Project), Feeder Balancing Dairy Complex, Patna -801505				
5.	Last Date & Time for uploading tender Documents by the bidder	25-02-2020 (Tuesday) up to 15.00 hours on website: www.eproc.bihar.gov.in				
6.	Last Date, Time and Place for submission of original instrument of EMD & Cost of BOQ	28-02-2020 (Friday) up to 15.00 Hours at VPMU (Patna Dairy Project), Feeder Balancing Dairy Complex, Patna- 801505				
7.	Date, Time and Place of opening of Techno Commercial bid	29-02-2020 (Saturday) at 15.30 hours on Website: www.eproc.bihar.gov.in				
8.	Date, Time and Place of opening of Price bid	Date & Time will be communicated later, Subsequent to finalization of techno-commercial bid. Place: www.eproc.bihar.gov.in				
9.	Bid validity period	180 (One hundred Eighty days).				
10. Details of work are as below:-						
Sl. No.		Estimated cost (Rs. in Lakh)	Bid Processing fee (Rs.) (To Beltron)	Bid document cost in Rs.	Bid Security (EMD) (in Rs.) 2% of Estimated cost	Time of Completion
	Supply, Installation & Commissioning of Mechanical type Double Head Milk Packing Machine, capacity 5,000 PPH as per Technical Specification. Qty required - 01 Set	15.00	1,000.00+ Tax	5,000.00	30,000.00	5 (Five Months)
	Supply, Installation & Commissioning of Crate Washer with Drier of capacity - 800 Crates / hour for HAJIPUR dairy as per Technical Specification. Qty required - 01 Set	25.00	1,000.00+ Tax	5,000.00	50,000.00	5 (Five Months)
11. The tender documents can be obtained through website www.eproc.bihar.gov.in . The undersigned reserves the right to reject any or all tenders / extend or cancel the tender/tenders at any time without assigning any reason thereof. No cost what so ever shall be claimed on such account by the bidder.						

Managing Director

GOVERNMENT OF INDIA

MINISTRY OF FINANCE

DEPARTMENT OF INVESTMENT AND PUBLIC ASSET MANAGEMENT

GLOBAL INVITATION FOR EXPRESSION OF INTEREST FOR PROPOSED STRATEGIC DISINVESTMENT OF AIR INDIA LIMITED BY WAY OF THE TRANSFER OF MANAGEMENT CONTROL AND SALE OF 100% EQUITY SHARE CAPITAL OF AIR INDIA LIMITED HELD BY GOI, WHICH WILL INCLUDE AI'S SHAREHOLDING INTEREST OF 100% IN AIR INDIA EXPRESS LIMITED AND 50% IN AIR INDIA SATS AIRPORT SERVICES PRIVATE LIMITED

Air India Limited (AI) is a wholly owned Government of India Company under the administrative control of Ministry of Civil Aviation engaged in the activity of Air Transport Operations and allied activities operating both domestically and internationally.

Government of India (GOI) proposes Strategic Disinvestment of AI by way of the transfer of management control and sale of 100% equity share capital of AI held by GOI, which will include AI's shareholding interest of 100% in the Air India Express Limited and 50% in Air India SATS Airport Services Private Limited. GOI has appointed Ernst & Young LLP, India (EY), as its sole Transaction Advisor (TA) to advise and manage the strategic disinvestment process.

This disinvestment process is to be implemented through open competitive bidding route. A Preliminary Information Memorandum for inviting Expression of Interest (EOI) from interested bidders can be downloaded from websites of Department of Investment and Public Asset Management at <http://dipam.gov.in>, Ministry of Civil Aviation at <http://www.civilaviation.gov.in/>, AI at <http://www.airindia.in> and Transaction Advisor at http://www.ey.com/en_in/alerts-hub. The EOI is invited to be submitted from Interested Bidders at the address mentioned below up to 17:00:00 Hrs on or before 17th March, 2020. In future, any amendments/extension for submission of EOI will be uploaded on the above websites.

Address for submission of EOI: Mr. Kuljit Singh/ Mr. Sushil Shyamal Vemu Partner, Ernst & Young LLP India
3rd Floor, Worldmark-1
IGI Airport Hospitality District
Aerocity, New Delhi-110037, India
(Note: The above address for submission may be changed at the discretion of the TA)

davp 15601/11/0034/1920

Short Takes

Govt Eyes ₹10,000 cr via 7th Tranche of CPSE ETF

NEW DELHI: The government is planning to raise at least ₹10,000 crore through the 7th tranche of CPSE ETF which will open for anchor investors on Thursday. CPSE ETF runs a concentrated portfolio with a handful of stocks having weights of as high as 20% on the underlying index. The portfolio is concentrated towards the energy and oil sector. The issue will open for anchor investors on Thursday and for other institutional and retail investors, the next day – Nippon Life India Asset Management – which has been mandated to manage the CPSE ETF on behalf of the government –PTI

'UDAY Not Failure; New Scheme Likely in Budget'

NEW DELHI: Asserting that the UDAY scheme was not a failure, power minister R K Singh on Monday said an improved version of the programme, meant for revival for discoms and to ensure 24x7 power, may be announced in the Union Budget later this week. "We asked for a new (UDAY) scheme. We had discussions with the finance ministry... I am optimistic that the new scheme will find a place in budget," Singh said on the sidelines of the listing ceremony of the international bond of PFC at NSE. The minister also said, it would be great if the scheme finds a place in budget because it will address the requirements of the discoms... for ensuring 24x7 power supply. –PTI

Merchant Bankers Decline to Help CIL with Due Diligence

Refusal linked to nature of the fuel, which may derail miner's foreign acquisitions plan

Debjoy Sengupta @timesgroup.com

Kolkata: Coal India's foreign acquisitions plan has hit a roadblock with all top merchant bankers refusing to offer consultancy or carry out due-diligence of assets shortlisted by the state-run monopoly.

This is likely to delay the company's foreign ventures since it will now have to look for second-rung bankers ready to offer services to the coal sector.

"Coal is increasingly being considered a dirty fuel that adds to green-house effects and global warming," a Coal India executive said. "It prompted large financial groups to exit the sector following heavy pressure from environment groups. This is likely to inordinately delay the company's foreign ventures since it will now have to search for second-rung regional bankers who would be ready to offer consultancy despite global pressure against coal and related projects."

Last year, Coal India had identified six potential coking and semi-coking coal assets, two each in Australia, Canada and Russia. According to a memorandum of understanding with the coal ministry, Coal India was to submit binding bids for acquiring stakes in assets in Australia and Canada by March 2020.

"This might not be possible now," the executive said.

Assets shortlisted in Australia were working mines where Coal India was looking to acquire stakes. In Canada, these were ready to produce blocks where explorations are complete, land has been acquired and environmental clearances received.

It was planning to acquire minority stakes in each of these assets to start with, which would have been gradually increased, based on experience. It was also in talks with Mongolian authorities for importing coal.

Talks with Australian and Canadian companies were in advanced stages and Coal India was in the process of appointing merchant bankers for two pairs of assets identified in these countries. The final decision on the quantum of stakes in each of these projects were to be based on due-diligence reports.

"Last year when Coal India invited global tenders, merchant bankers such as Goldman Sachs and Merrill Lynch had already exited the dry fuel segment. However, a few global players like ANZ, BNP Paribas and JP Morgan were still working on coal assets. But recently, these bankers have also pulled out of coal, making it difficult for Coal India to appoint top bankers for the purpose," the executive said.

By the end of 2019, some 112 global financial institutions, holding more than \$10 billion worth of assets under management, had exited coal. Early this month, BlackRock, the world's largest money manager with \$7 trillion in assets under management, joined this list.

At the same time, global insurers divested roughly \$8.9 trillion of coal-based investments. Last year, coal exit policies were announced by 18 of the world's biggest insurers controlling more than 46% of the reinsurance market and in excess of 9.5% of the primary insurance market. Most of them now refuse to insure new mines and power plants. Cover majors have ended cover for existing coal projects and the companies that operate them and adopted similar policies for tar sands.

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Budget likely to Give Fillip to Asset Monetisation, PSU Sale

Long-term capital gains tax, dividend distribution tax norms may be eased

Our Bureau

Focus Areas

Enhance Private Sector Investment
Give a push to exports

- Speed up disinvestment of PSUs
- Aggressively undertake asset monetisation
- Proceeds from this could go back to private shareholders
- These funds could be used for funding capex

₹1.05 lakh crore: Disinvestment target 2019-20

₹18094.59 crore: Achieved so far

New Delhi: Budget 2020 is expected to give a renewed push to disinvestment and asset monetisation as the government strives for capital creation and investment promotion in the economy by augmenting non-tax revenue.

A top official told ET that the budget is likely to relax long-term capital gains tax and dividend distribution tax norms, besides setting a clear road map for the government to sell or significantly cut its stake in select PSUs and giving the proceeds to other shareholders for funding their capex.

"The focus will be to create more space for private sector through disinvestment and asset monetisation," the official said. Finance minister Nirmala Sitharaman will present the Union Budget on February 1.

"Disinvestment proceeds from listed PSUs with other stakeholders cannot be sent to the Consolidated Fund of India. This money should go back to them to help fund their expansion plans," the official explained.

NITI Aayog had proposed disinvestment in 26 sick PSUs, out of which the Cabinet has approved almost 20. However, delays at line ministries have meant disinvestment in the current financial year so far has remained low.

While work has started on divestment of Air India, Bharat Petroleum and Concor, efforts are being made to bring down stakes in other PSUs to below 51%, including BEMIL, Pawan Hans and Projects India.

Against the disinvestment target of ₹1.05 lakh crore for FY20, the government has raised ₹18,094.59 crore so far. That compares with ₹84,972.16 crore obtained from disinvestment in FY19 against the budget estimate of ₹80,000 crore.

With two months to go, the government is aggressively pushing to monetise assets of the Centre and central public sector enterprises, including guest houses, office space, apartments, factories, land, power transmission assets and sports stadiums.

Stock market experts have sought abolition of long-term capital gains tax on equities and mutual funds, and a shift from dividend distribution tax levied on companies to taxing dividend in the hands of investors.

According to the official, pushing investment demand in the domestic market and increasing exports can help improve the economy. "The worst is over and the economy will start looking up in the fourth quarter."

India's exports fell 1.96% to \$239.29 billion in the April-December period and imports declined 8.9% to \$357.39 billion, leaving a trade deficit of \$118.10 billion. It is estimated that overall exports for the current financial year will be \$330-\$340 billion, compared with last year's level of \$331 billion.

Economic growth fell to a 26-quarter low of 4.5% in the second quarter. The government has projected FY20 growth at 5%, which is a multi-year low.

The International Monetary Fund recently trimmed its growth projection for India to 4.8%.

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RUN UP TO THE BUDGET 2020-21

Nishtha Saluja @timesgroup.com

New Delhi: The National Highways Authority of India will seek approval from its board for flexibility in awarding road projects and not always go by a formula devised earlier.

When Bharatmala, the government's flagship highway construction programme, was approved in 2017, the standard operating procedure was to award 60% of the planned roads under the hybrid annuity mode (HAM), 30% as engineering, procurement and construction (EPC) contracts and 10% as build-operate-transfer (BOT) projects.

NHAI now wants to award projects depending on market conditions, an official told ET. It wants to focus more on the EPC mode of road building. "NHAI is moving the board asking for flexibility since the 60:30:10 formula is not always implementable," the official said. "This is highly market-driven."

Under HAM, the government provides 40% of the construction cost. The rest is arranged by the developer. Land acquisition and toll collection are the government's responsibilities. Private investment via BOT has been subdued over the past few years.

Road transport and highways minister Nitin Gadkari said in a recent interview with ET that the ministry would stick to the EPC mode, which is fully funded by the government.

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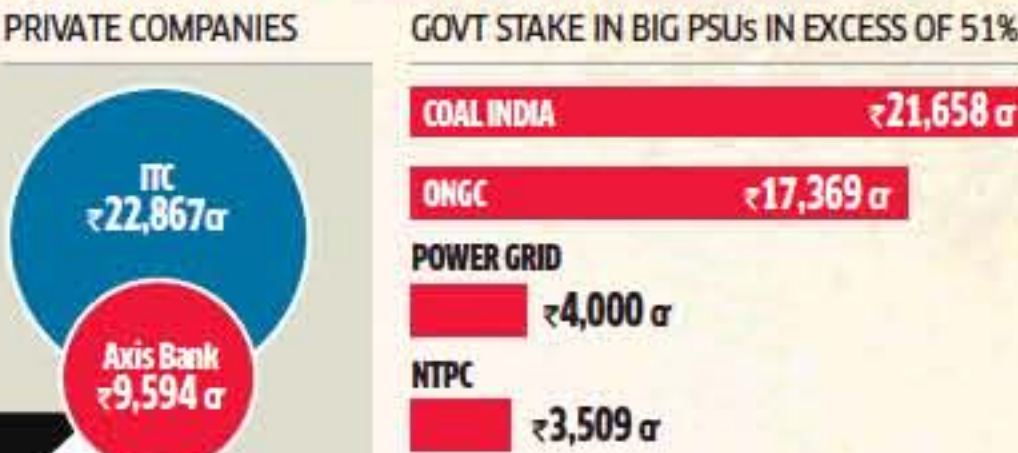
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DISINVESTMENT ON RADAR

With very little fiscal room to manoeuvre, disinvestment is under focus like never before. There is a lot of silverware that the government has that it can sell, but the process has always been marred by delays. ET takes a look at government's assets that it can monetise.

1 Liquid Assets – Shares in Big Listed Companies



2 Strategic Sales Cleared



KSK Mahanadi Power Company Limited
(Under Corporate Insolvency Resolution Process)
8-2-293/82/A/431/A, Road No.22, Jubilee Hills, Hyderabad – 500033, India. Website: www.ksk.co.in

International Competitive Bidding (ICB) – Flue Gas Desulphurization (FGD) system (Wet Limestone or Ammonia based technology) and its auxiliary facilities

KSK Mahanadi Power Company Limited (Owner) intends to set-up 'Flue Gas Desulphurization system' (Wet Limestone or Ammonia based system) for its 3 x 600 MW Coal based Thermal Power plant located at village Nariyara, Janjira-Champa District, Chhattisgarh, India.

The Owner invites sealed bids through ICB mode from eligible bidders, for the FGD system based on one or both the technologies, on EPC basis.

Interested bidders may submit their bids and are advised to download the 'Pre-Qualification Requirements' from our website or send request to e-mail: acharyulu.m@ksk.co.in

ICB process Schedule:

Expression of interest publication : 31.01.2020	Pre-Bid conference at site : 18.02.2020
Finalization of Bidders : 04.02.2020	Submission of Technical Bids : 10.03.2020

Owner reserves the right to reject any or all offers or cancel the bidding process without assigning any reason, whatsoever. Owner shall not be liable on any account in case of rejection of any bid or cancellation of bidding process at any time.

Sd/-
Interim Resolution Professional of KSK Mahanadi Power Company Limited
Reg. No.: IBBI/IPA-001/IP-P00033/2016-2017/10086

JK PAPER LTD.
Creating lasting impressions

PASSION TO PERFORM

GROWTH TREND : 9 MONTHS – Standalone (₹ Crore)

	EBITDA			PBDT			PAT		
	2017-18	2018-19	2019-20	2017-18	2018-19	2019-20	2017-18	2018-19	2019-20
	464.55	683.44	784.73	354.54	595.81	692.88	186.55	324.97	401.35

UNAUDITED FINANCIAL RESULTS (STANDALONE & CONSOLIDATED) FOR THE QUARTER & NINE MONTHS ENDED 31ST DECEMBER, 2019

₹ In Crores

Sr. No.	Particulars	STANDALONE			CONSOLIDATED						
		Quarter Ended		Year Ended	Quarter Ended		Year Ended				
		31.12.2019	31.12.2018	31.03.2019	31.12.2019	31.12.2018	31.03.2019				
1	Income from Operations (Gross)	881.25	931.87	2,493.37	2,629.08	3,491.86	880.62	931.77	2,493.60	2,629.08	3,492.26
2	Total Income from Operations (Net)	840.68	883.94	2,386.68	2,481.19	3,312.07	849.25	883.56	2,397.38	2,478.26	3,306.71
3	Profit before Interest and Depreciation (EBITDA)	256.95	262.06	784.73	683.44	926.05	259.25	259.78	767.92	678.54	918.12
4	Net Profit before tax from ordinary activities and Exceptional Items #	189.43	198.78	583.95	501.93	678.35	188.36	189.82	559.39	488.89	666.04
5	Net Profit after tax from ordinary activities and Exceptional Items #	132.28	120.26	401.35	324.97	437.20	131.86	113.80	382.63	315.01	427.28
6	Total Comprehensive Income for the period [comprising Profit for the period (after tax) and Other Comprehensive Income (after tax)]	131.53	119.72	398.96	320.59	433.88	131.30	113.62	380.92	311.07	424.28
7	Equity Share Capital	178.24	178.24	178.24	178.24	178.24	178.24	178.24	178.24	178.24	178.24
8	Other Equity as shown in the Audited Balance Sheet of the previous year					1,882.97					1,859.86
9	Earnings Per Share in ₹10/- Share (EPS for the Quarters are not Annualised)										
i	Basic :	7.42	6.75	22.52	18.27	24.57	7.40	6.25	21.08	17.71	23.88
ii	Diluted :	7.42	6.75	22.52	18.14	24.51	7.40	6.25	21.08	17.58	23.82

Notes :

- Pursuant to the requirements of SEBI (LODR) Regulations, 2018 (as amended), the Company has published consolidated quarterly and YTD results. The consolidated results of the corresponding periods are management certified figures.
- The above is an extract of the detailed format of Quarter and Nine Months Ended December 31, 2019 Financial Results filed with the Stock Exchanges under Regulation 33 of the SEBI (Listing Obligations and Disclosure Requirements) Regulations, 2015. The full format of the Financial Results are available on the Stock Exchange websites of BSE and NSE at www.bseindia.com and www.nseindia.com respectively and also on Company's website at www.jkpaper.com.

The Company does not have any Exceptional Items to report in above periods.

For JK PAPER LTD.
Harsh Pati Singhania
(Vice Chairman & Managing Director)

Place : New Delhi
Dated : 27th January, 2020

Multipurpose office papers from JK Paper

Admin Office: Nehru House 3rd Floor, 4 Bahadur Shah Zafar Marg, New Delhi - 110002, Ph: 91-11-33001132, 33001112, Fax: 91-11-23712680
Regd. Office: Central Pulp Mills, Fort Songadh, Dist. Tapi, Gujarat - 394660, Website: www.jkpaper.com
Corporate Identity Number: L21010GJ1960PLC018099 • [f/jkpaperindia](https://www.facebook.com/jkpaperindia) • [t/jkpaperindia](https://www.twitter.com/jkpaperindia)

RECOMMENDATION OF CEA FOR FGD INSTALLATION AT KSK MAHANADI POWER COMPANY LTD INTRODUCTION

BRIEF REVIEW OF THE NEW MoEF REGULATION

The present notification from MoEF&CC amends existing norms related to emission of SPM and introduces new norms for emission of SO₂, NO_x and Mercury from Thermal Power Plants (TPPs). It also specifies modified limits for specific water consumption by TPPs and insists to convert existing once through based condenser cooling system to recirculation type. Different limits are specified based on capacity of power plant and year of installation. A summary of new regulations on air emission is given in below;

NEW REGULATIONS ON EMISSION

Date of Installation	PM	SO ₂	NO _x	Mercury (Hg)
Before 31-12 2003	100 mg/Nm ³	600 mg/Nm ³ for <500MW 200 mg/Nm ³ for ≥500MW	600 mg/Nm ³	0.03 mg/Nm ³ for ≥500MW
After 01-01-2003 & Upto 31-12-2016	50 mg/Nm ³	600 mg/Nm ³ for <500MW 200 mg/Nm ³ for ≥500MW	300 mg/Nm ³	0.03 mg/Nm ³
On or after 01-01-2017	30 mg/Nm ³	100 mg/Nm ³	100 mg/Nm ³	0.03 mg/Nm ³

SUMMARY OF NEW REGULATIONS ON WATER USE

Sl. No.	New requirement
1	All plants with Once Through Cooling (OTC) shall install Cooling Tower (CT) and achieve specific water consumption up to maximum of 3.5 m ³ /MWh within a period of two years from the date of publication of notification.
2	All existing CT-based plants reduce specific water consumption up to maximum of 3.5 m ³ /MWh within a period of two years from the date of publication of notification.
3	New plants to be installed after 1 st January 2017 shall have to meet specific water consumption up to maximum of 2.5 m ³ /MWh and achieve zero waste water discharged.

Further, to the above MoEF & CC notification, MoEF & CC has subsequently issued an Amendment dated 28th June 2018 for stack height post FGD and water Consumption which is mentioned below:

SUMMARY OF NEW DRAFT AMENDMENT

Chimney Height post FGD installation:

Sl. No.	Industry	Parameter	Standards
1	Thermal Power plants with Flue gas Desulfurization (FGD)	Chimney Height/Limit in Meters	Power Generation capacity : 100 MW and above $H = 6.902 (QX0.277)^{0.555}$ Or 100 m Whichever is more
			Less than 100 MW $H = 6.902 (QX0.277)^{0.555}$ Or 30 m Whichever is more Q = Emission rate of SO ₂ in kg/hr* H = Physical chimney height in meter * Total of all units connected with chimney. Note: These standards shall apply to coal / lignite based thermal power plants.

- All monitored values for SO₂ and NO_x shall be corrected to 6% Oxygen, on dry basis.
- Specific water consumption shall not exceed maximum of 3.0 m³/MWh for new plants installed after the 1st January 2017 and these plants shall also achieve zero waste water discharge.
- Seawater based plants are exempted from conversion of once through cooling system to Cooling Tower based system.

TARGET SO₂ EMISSION VALUE FOR KSK MAHANADI POWER COMPANY LTD

The Three units (03) of 600MW each (#2, #3 & #4 1800 MW) out of 06 units of 600 MW at KSK Mahanadi Power Company Ltd are operational and these units were commissioned on:

Unit#2 26th February 2018

Unit# 3 14th August 2013

Unit #4 26th August 2014

The rest three units (#1, #5 and #6) are under construction and will be operational by 2022. The applicable SO_x emission limit for KSK Mahanadi Power Company Ltd unit #3 & #4 is 200 mg/Nm³ and for unit #2, #1, #5 & #6 is 100 mg/Nm³. However, to take care of variation in operating input parameters such as deterioration in coal quality, higher sulphur content in coal, higher flue gas temperature and flow, higher plant heat rate etc. sufficient design margin needs to be considered on actual performance parameters.

APPLICABLE NORMS FOR KSK MAHANADI POWER COMPANY LTD

Year of commissioning	Unit no	SPM	SO ₂	Nox	Mercury
2003-2016	3 & 4	50mg/Nm ³	200 mg/Nm ³	300mg/Nm ³	0.03mg/Nm ³
On or after 01-01-2017	#2 & other three units	30 mg/Nm ³	100 mg/Nm ³	100 mg/Nm ³	0.03 mg/Nm ³

Salient Features of Power Plant:

1. Plant Capacity: 6x600 MW=3600 MW with Sub-critical technology.
2. No of Units operational: 03 (1800 MW)
3. No of units under construction:03 (1800MW)
4. Average Availability (2017-18) :76.49 %
5. Average PLF(2017-18):54.63 %
6. Major PPA: 55% UPPCL
7. Average actual GCV (2017-18): 4006 Kcal/kg.
8. Sulphur in Coal in different years of operation is 0.31% to 0.69%.

TECHNOLOGY

In feasibility report KSK Mahanadi Power Company Ltd has opted for "Wet Lime Stone" based FGD technology. Wet Lime stone Base So₂ removal technology is technically feasible for KSK Mahanadi Power Company Ltd. While considering Wet lime stone based FGD, the reagent source may be selected based on availability of limestone, limestone purity, cost and quality.

ENGINEERING ASPECTS

1. **Absorber**-Individual absorber for each Unit.
2. Limit SO₂ below environment norms with up to 0.6% Sulfur content in Coal.
3. **Absorber Lining** – Such as Ceramic Tiles/clad sheet of C-276/Alloy 59 /Steel Alloy/Glass flake filled multi-functional epoxy /glass flake lining etc.
4. **Other lining** - All ducts, effluent handling pits or concrete zone etc. to be protected with glass flake based coating/ Steel Alloy Lining etc. Piping may be of flake glass based coating/carbon steel rubber lined (CSRL)/rubber lining however lesser diameter pipes can be of GRP(Glass Reinforced Plastic)/FRP (Fiber Glass reinforced Plastic)/ Alloy Steel material etc.
5. **Monitoring System**- Measurement of SO₂ in the outlet and inlet are important for the calculation of the FGD efficiency and control the amount of reagent. The important parameters for deciding monitoring system are response time (shorter the better), less inventory (common for inlet and outlet), less maintenance (high maintenance interval). In view of this proven advance technology may accordingly be selected considering the plant specific requirements.
6. **Auxiliary Power Consumption**- The maximum Additional Auxiliary power Consumption for complete FGD facilities will be maximum 1.0% for Limestone based FGD.

If the existing chimney is used, the requirement of GGH may be seen. The additional Auxiliary Power Consumption with GGH (only if using old chimney) will be maximum 0.3%.

INDICATIVE COST ESTIMATION

An indicative Base cost estimation is done by CEA in order to facilitate KSK Mahanadi Power Company Ltd determine the price for installation of FGD on the major heads of CAPEX .

CAPEX

Rs. 0.37 Cr/MW (BASE COST) for lime stone base FGD. This indicative cost is the "Base Cost" only and does not include Opportunity cost (associated with generation loss due to interconnection of chimneys with absorber) and Taxes-Duties. This Indicative "Base cost is calculated considering new chimney without GGH.

The cost of retrofitting FGD for KSK Mahanadi Power Company Ltd should be discovered through open competitive bidding in consultation with lead procurer. The lead procurer (to be invited by KSK Mahanadi Power Company Ltd) may participate in bidding process till final award of FGD contract.

OPEX

Operating Cost (OPEX) will include Reagent cost, Additional water consumption associated with FGD, Manpower cost, Auxiliary Power Consumption, By-product handling and revenue earned through disposal of by product. The OPEX should be kept as low as possible by reducing Auxiliary Power Consumption and producing good quality of saleable by-product.

OPPORTUNITY COST

Since interconnection of chimneys with absorber may result in loss of generation of the plant, hence KSK Mahanadi Power Company Ltd is advised to minimize this interconnection time by taking suitable measure so that the "Opportunity cost" associated with interconnection may have least impact on tariff revision.

CHIMNEY & LINING

In feasibility report KSK Mahanadi Power Company Ltd has opted for using new wet chimney.

Option I (As opted by KSK Mahanadi Power Company Ltd)

Separate new wet chimney over ground for each absorber.

The other chimney options for KSK Mahanadi Power Company Ltd are as follows:

Option II

New permanent wet chimney above each Absorber.

Option III

New single wet chimney with three flue cans (for three units) or three wet chimney with twin flue cans for all six units.

Option IV

Using Existing chimney by converting it to Wet Chimney by applying appropriate corrosion protection lining. To avoid excess loss of generation a temporary chimney may be provided above each absorber or on ground.

Final selection of chimney may only be made after conducting a lifecycle cost benefit analysis and seeing technical feasibility of available options before opting for either of above option.

Corrosion Protection Lining for Chimney:

Currently there are various lining material are available in the industry which can resist the sulfur based acids and which can be used for corrosion protection as mentioned below.


- i. Borosilicate Block lining
- ii. Steel Alloy lining
- iii. Glass flake filled epoxy phenol novolac.
- iv. Glass flake lining etc.

KSK Mahanadi Power Company Ltd is advised to study “the cases of failure” of all lining material used for corrosion protection for various sections of FGD system. The life cycle cost analysis for selection of these materials may be done considering these failure studies for optimum selection.



KSK MAHANADI POWER COMPANY LIMITED
KSK MAHANADI POWER PLANT (3X600 MW)

FLUE GAS DESULPHURISATION SYSTEM
PRE QUALIFICATION

Job No	D-0476	Name/Sign	Date	
Prepared By		MVBR	22.01.2020	
Checked / Reviewed By		BHS	22.01.2020	
Document No.		D-0476-4192-PQR-R2		



KSK MAHANADI POWER COMPANY LIMITED
KSK MAHANADI POWER PLANT (3X600 MW)

**TECHNICAL SPECIFICATION
FOR
FLUE GAS DESULPHURISATION SYSTEM**

Job No	D-0476	Name/Sign	Date	
Prepared By		MVBR/DDT/ GAURAV/KK	30.06.2020	
Checked / Reviewed By		BHS	30.06.2020	
Document No.		D-0476-4192-TS-R1		

Feasibilities studies completed and documentation completed on 2018

- **Technology and financials approved by Central Electricity authority for all 6 units on 17.05.2019**
- **For Unit-III,IV and II**
- **Tender specification made and NIT issued on on 3.7.2020**
- **Submission of Technical bids and assessment of Bids is under progress**
- **Finalisation of technical Bid and Financial bids before 31.12.2023**
- **Unit-III- FGD system to be installed on or before 30.6.2026**
- **Unit-IV- FGD systems to be installed on or before 30.09.2026**
- **Unit-II- FGD systems to be installed on or before 31.12.2026**
- **MOEF Notification, dtd.05.09.2022, Specified time frame- 31.12.2026**



भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केन्द्रीय विद्युत प्राधिकरण
Central Electricity Authority
अल्ट्रा मेगा विद्युत परियोजना विकास प्रभाग
Ultra Mega Power Projects Development Division

सं.:44/FGD/ यूएमपीपी/सीईए/2019/444

दिनांक: 17-05-2019

सेवा में,

Sh. K.S.Shastry, Executive Director,
Mahanadi Power Plant/Wardha PCPL, KSK Energy Ventures Limited
8-2-293/82/A/431/A, Road No.22, Jubilee Hills, Hyderabad, 500033

Subject: Advice on suitable technology and indicative cost in installation of FGD to meet the new MOEF & CC Emission norms in 6X600 MW KSK Mahanadi Power Company Limited, Chhattisgarh.

Sir,

In reference to the new Environmental norms as per Environment (Protection) Amendment Rules 2015- Installations of FGD at KSK Mahanadi Power Company Limited, Chhattisgarh; KSK Mahanadi had submitted the revised feasibility report wherein the best suited technology and estimated indicative cost was proposed for installations of systems to control emission from the power plant.

Also, on the basis of plant specific data provided by KSK Mahanadi Power Company Limited, Chhattisgarh, as well as the present technologies available and other related conditions, a recommendation report has been prepared detailing suggestive technology and estimated indicative cost in installations of FGD (Flue Gas Desulphurization Systems) at 6X600 MW thermal Power Plant at Nariyara, Janjgir Champa District, Chhattisgarh. The cost of retrofitting of FGD for the plant needs to be discovered through open competitive bidding in consultation with representatives of major PPA stakeholder. KSK Mahanadi Power Company Limited, Chhattisgarh may invite the major PPA stakeholder to participate in bidding process till final award of FGD contract.

However, in respect of installations of FGD systems; it would be the sole responsibility of Power Plant to meet the time-limit as prescribed by appropriate Pollution Control Board. Further, KSK Mahanadi Power Company Limited, Chhattisgarh may submit the status of progress of all activities of installation starting from bidding stage till commissioning of FGD to CEA on monthly basis.

Enclosed: Recommendation report

भवदीय,

(चन्द्र शेखर)

मुख्य अभियंता

Tel. 26195472

Copy:

Secretary, CERC: for information

Annexure-XXX

History of Coal sourcing & e-forwarding

M/s KSK Mahanadi Power Company Limited, village-Nariyara

- ❖ KMPCL had firm coal linkage from 'Morga-II' Coal block of 'Gujarat Mineral Development Corporation Limited' (GMDC) (for first three Units) and 'Gare Pelma Sector-III' coal block of 'Goa Industrial Development Corporation' (GIDC) (for last three Units).
- ❖ The coal requirement for the power plant is about 14.14 Million Tonnes Per Annum (MTPA) and was to be transported from coal mines to the site through rail mode.
- ❖ Due to delay in development of 'Morga-II' coal block, KMPCL approached 'Standing Linkage Committee (Long Term)' (SLC (LT)) and SLC (LT) authorized issuance of 'Letter of Assurance' (LOA) by Coal India Limited on tapering basis on 12.11.2008.
- ❖ On 11.06.2009, 'South Eastern Coalfields Limited', issued a 'Letter of Assurance' (LOA) for 74,91,000 (7.49 MTPA) tonnes per annum to meet the coal requirement of 1800 MW (Units 1 to 3) out of 3600 MW capacity at the power plant.
- ❖ Obtained amendment in EC including Tapering coal linkage allocated by SECL as coal source until coal block becomes operational in 24.01.2012 for three units

- ❖ In accordance with CCEA decision, Government of India through Presidential Directive dated 17.07.2013, mandated 'Coal India Limited' to sign Fuel Supply Agreements with Power developers including Tapering Linkage holders, identified by Ministry of Power for supply of the domestic coal quantity of 65%, 65%, 67% and 75% of 'Annual Contracted Quantity' (ACQ) for the remaining four years of the 12th Plan (i.e. from 2013-14 up to 2016-17).
- ❖ Further, New Coal Distribution Policy issued by Ministry of Coal, Government of India was amended on 26.07.2013 to outline the above directives for implementation.
- ❖ It was also directed that to meet its balance FSA obligations, CIL may import coal and supply the same to willing power plants on cost plus basis or Power plants may also directly import coal themselves, if they so opt.
- ❖ On 19.03.2014, 'Fuel Supply Agreement' (FSA) was signed between KMPCL and 'South Eastern Coalfields Limited' to supply 49,94,000 tonnes per annum to meet the requirement of two units of 600 MW capacity each (1200 MW).
- ❖ Through this FSA, SECL committed to supply 3.2461 MTPA (65% of ACQ) in 2014-15, 3.34598 MTPA (67% of ACQ) in 2015-16 and 3.7455 MTPA (75% of ACQ) in 2016-17 to meet the requirement of two units.

- ❖ Third unit, Fuel Supply Agreement was signed between 'Eastern Coalfields Limited' and KMPCL on 12.08.2014 for 1.763 MTPA.
- ❖ Hon'ble Supreme Court, vide its orders dated 25.08.2014 & 24.09.2014 has cancelled allocation of all the coal blocks which also included 'Morga-II' and 'Gare Pelma Sector-III' Coal Blocks that were linked to KMPCL project.
- ❖ Pursuant to the cancellation of allotment of coal blocks by Hon'ble Supreme Court, Ministry of Coal, on 30.06.2015, cancelled the tapering linkage granted to KMPCL and directed CIL (SECL) to continue coal supplies to the Power Plant under MOU mechanism till 31.03.2016 or till formulation of new policy by Government of India, whichever is earlier.
- ❖ SECL is continuing coal supplies to 2 Units under the MOU dated 13.07.2015 to the extent of 67% of the 'Annual Contracted Quantity' (ACQ).
- ❖ To meet the balance quantity of coal & considering the inferior quality of coal supplied by SECL (which is lesser than design specification of Boiler of power plant), it is now necessary to procure coal of higher GCV including imported coal (available through Rail mode), in addition to E-auction coal and E-auction coal (washed coal) available through Road and rail Mode. Blending of SECL's coal with high GCV Coal from Imported and E-auction sources will meet the boiler requirements and also meet the balance coal requirement of the KMPCL units.

- ❖ To meet the balance coal requirement of for two units, KMPCL is also sourcing coal from SECL through forward e-auction process, which is supplied by SECL only by Road mode.
- ❖ Till November 2015, Railway Logistics Plan allowed only Western Ports to procure imported coal for the Power Plants situated in the state of Chhattisgarh.
- ❖ Railway Board, Ministry of Railways approved the procurement of imported coal by KMPCL from Eastern Ports namely Gangavaram, Vizag, Kakinada and Krishnapatnam ports (through Nagpur route). Rail distance from Kandla Port to KMPCL Power Plant is 1675 km, which amounts to Rs. 3277 per tonne transportation cost.
- ❖ After approval of Eastern Port through Nagpur route, the distance has come down to 1467 km which has reduced the transportation cost to Rs.2865 per tonne and coupled with the fall in prices of imported coal, it is now financially viable to procure imported coal.
- ❖ Now on the basis of approval provided by the Railway Board, KMPCL is intending to import coal from eastern ports.
- ❖ Considering all above, to meet the balance coal requirement till CIL supplies 100% of coal from Domestic Sources, KMPCL is planning to procure coal through forward e-auction by Rail / Road mode, local vendors supplying SECL/CIL coal by Road mode and Imported coal from different countries including Australia, South Africa, USA, etc.

Annexure-XXXI

CSR Activities

KSK Mahanadi Power Company Limited

CSR Budget for 2016-17

Sr. No.	Focus Area	Unit	Budget Amount (In Crore)	Amount Spent (In Crore)	Completed/ In Progress
A.	Education & Capacity Building				
1	Construction of Public School/Industrial Training institute/Skill Development Centre/Capacity Building etc.	Expenses for ITI Training to 09 Student's	175.00	1.90	Completed 9 Student's
2	Scholarships to Students of power plant area and local area	Students of High and Higher Secondary school Level in villages of Nariyara, Taround, Amora, Latiya, Pakaria and sheonarayan, Basantpur and Dongarkahroud	2.75	0.00	
3	Sports items distribution and Sports Development activities in villages power plant area and local area	Distribution of sports material to 15 Schools in villages of Nariyara, Taroud, Murlidih, Latiya, Pakaria, Sheonarayna, Basantpur	5.10	0.16	Completed 02 School's
4	Renovation of Govt. Schools like Toilets for Girls, Library, Compound wall, Play Ground, Drinking water, E- Learning Classes, Electric Facilities Extension like fan, electrical wiring etc.	Support to ECO Clubs and cultural programs in Govt. schools (Swachh Bharat Abhiyan) in villages in villages of Nariyara, Taround	2.00	0.20	Completed
		Construction and repairing of Bio Tiolet/Drinking Water in 10 Schools in villages of Nariyara, Amora, Banahil, Dongakahrod and Basantpur	6.00	3.06	Completed 10 School's
		Repairing of Kitchen Shed/ Cultural Sehd at Govt. Priamry & Middle School Rogda and Latiya	2.00	0.00	
		Renovation of 01 School building like flooring, plaster, door, window, gate etc. at Nariyara & Rogda	4.00	0.00	
		Construction of Boundary wall and Tiolets at Saraswati Shishu Mandir Akaltara	20.00	0.00	
6	Establishment of 03 Training Centers in local area	3 Tailoring/Computer Centers in villages of Nariyara, Taraud and Basantpur	5.55	0.00	
Sub-Total (A)			223.85	5.32	



KSK Mahanadi Power Company Limited

CSR Budget for 2016-17

Sr. No.	Focus Area	Unit	Budget Amount (In Crore)	Amount Spent (In Crore)	Completed/ In Progress
B.	Health Care				
1	Infrastructure development of Govt. Health Centers and Anganwari Centers in power plant area	Renovation of 7 anganwadi Centers in Nariyara, Taroud, Murlidih, Latiya and Basantpur	7.00	0.37	Completed
		Boundary wall construction/Infrastructure development of Govt. Health Centers for Sub Health Center at Amora village	4.00	3.98	Completed
2	Continuation of mobile dispensary (Diesel & Maintenance and Consultancy fee, medicines for health camp)	1 Doctor, 1 Nurse, 1 Compounder, 6 Drivers in villages Amora, Rogda, Banahil, Murlidih, Latiya, Pakaria, Dongakahrod and Jhalmala	2.28	14.55	Completed
3	Sepcial Health Camps - Eye Camps, Child Health Camps, Family planning camps, Tuberculosis, Leprosy eradication, Support for medical treatment to neddy person	Mega Health Camps/Support for medical treatment to neddy person	0.40	1.75	Completed
4	Construction of 02 Water Overhead Tank	Pakariya and Murlideeh	29.70	0.00	
5	Expansion of Pipe Line and strengthening Nal Jal Yojna - 28978 Meter	Pipe Line Expansion Nariyara-7000 Mtr	49.60	13.28	Completed 1446 Meter
		Pipe Line Expansion Taroud-280 Mtr	1.68	0.00	
		Pipe Line Expansion Amora-1100 Mtr	6.60	0.00	
		Pipe Line Expansion Banahil 600 Mtr	3.60	0.00	
		Pipe Line Expansion Rogda 650 Mtr	3.90	0.00	
		Pipe Line Expansion Murlidih-1500 Mtr	9.00	0.00	
		Pipe Line Expansion Latiya-1200 Mtr	7.20	0.00	
		Pipe Line Expansion Pakariya-1400 Mtr	8.40	0.00	
		Pipe Line Expansion Donga Kohroud-1200 Mtr	7.20	0.00	
		Pipe Line Expansion Other Villages-400 Mtr	2.40	0.00	



KSK Mahanadi Power Company Limited

CSR Budget for 2016-17

Sr. No.	Focus Area	Unit	Budget Amount (In Crore)	Amount Spent (In Crore)	Completed/ In Progress
B.	Health Care				
6	Construction of Drainage Line in concerning villages -7220 Meter	Drainage Construction Rogda- 300 Mtr	3.45	0.00	
		Drainage Construction Amora- 400 Mtr	4.60	0.00	
7	Installation of Submersible Pump/Tubewells/ Borewells/Hand pump installation at 08 Schools and Common places of power plant area	05 submersible Pumps in villages of Nariyara, Taroud, Dongakahrod	3.75	0.70	Completed
		Installation of 2 No. of Submersible Pump through Solar Energy(CREDA) in villages of Nariyara, Murlidih	8.81	0.00	
		Repairing of 6 Submersible Pumps in villages of Nariyara and Murlidih	0.00	0.02	Completed
8	Installation of Drinking Water Facility	Installation of Water Cooler at Sub Health Center Amora	1.00	0.00	
9	Installation of 10 New Handpumps	10 Hand Pumps in Dongakahrod, Basantpur and Sheonarayan	7.00	1.53	Completed 4 New Hand Pump
10	Repairing of 40 Default Handpumps	40 Handpumps in Taraud, Amora, Rogda,Banahil, Murlidih,Latiya, Pakaria, Dongakahrod	0.31	0.36	Completed Repaired 21 Hand Pump
Sub-Total (B)			171.88	36.53	



KSK Mahanadi Power Company Limited

CSR Budget for 2016-17

Sr. No.	Focus Area	Unit	Budget Amount (In Crore)	Amount Spent (In Crore)	Completed/ In Progress
C.	Sustainable Development				
1	Help to Entrepreneurs for Small industry establishment in power plant area and local area	In villages of Taraud, Rogda and Pakaria	7.00	0.00	
2	Help to 13 WSHG for Income generation Activities	In villages of Taraud, Rogda and Pakaria and Basantpur	6.46	0.00	
3	Hybrid Seeds/Plants Distribution, Trainings for farmers for new Agriculture practices, Tree Plantation	installation of 20 No of Bio Gas thorough CREDA in villages of Nariyara, Taraud, Amora, Banahil, Latiya and Tree Plantation Under Hariyar Chhattisgarh Program	2.00	20.78	Completed Tree Plantation Hariyar C.G. Program-Pakariya
4	Soil and Water Conservation programme like Stop dams, Pond construction and beautification of ponds	Pond Deepening at Murlidih	2.00	0.30	Completed 01 Pond-Amora
5	Repairing of Canals in villages of Local area	Repairing of Canals of Amora	5.00	0.00	
6	Development of grazing land/ garden development	In Basantpur, Taroud & Janjgir Champa	1.59	0.88	Completed 02 Garden
7	Animal Husbandry development like Dairy development, Breed development	In villages of Nariyara, Amora, Murlidih	3.00	0.47	Completed
Sub-Total (C)			27.05	22.43	



KSK Mahanadi Power Company Limited

CSR Budget for 2016-17

Sr. No.	Focus Area	Unit	Budget Amount (In Crore)	Amount Spent (In Crore)	Completed / Progress
D.	Infrastructure Development				
1	Construction of 10 community building in power plant area	6 Community buildings in 5 villages of Nariyara, Amora, Banahil, Mulidih, Sheonarayan	40.00	6.19	Completed
2	Electricity Expansion for Power plant villages	Electrification of 60 Street Lights through Solar Energy (CREDA) in villages of Nariyara, Taraud, amora, Banahil, Latiya and Dongakahrod	31.41	0.70	Completed
3	Construction of community and public Toilets	Construction of Toilets for 80 BPL families (Swachh Bharat Abhiyan) in villages of Amora, Dongakahrod	5.00	0.00	
4	Construction of CC / WBM Road in four villages - 14540 Meter	CC Road Construction Nariyara- 1600 Mtr	50.60	0.00	
		CC Road Construction Taroud- 210 Mtr	9.60	0.00	
		CC Road Construction Rogda-300 Mtr	16.00	10.59	Completed 380 Meter
		CC Road Construction Amora- 300 Mtr	17.60	8.15	Completed 250 Meter
		CC Road Construction Murlideeh- 200 Mtr	12.80	11.15	Completed 450 Meter
		CC Road Construction Latiya- 500 Mtr	12.86	5.08	Completed 200 Meter
		CC Road Construction Pakariya- 300 Mtr	16.00	4.69	Completed 200 Meter
		CC Road Construction Banahil village-300 Mtr	16.00	0.00	
		Const. of WBM Road from Puji Kenwat house to irrigation colony (canal) of Nariyara village	12.00	5.55	Completed 240 Meter
		Repairing of WBM road from Nawapara to Bridge no - 10 (600 Meter), Taraud & Dongakohroud	5.50	3.99	Completed 03 villages
		Fixing of Hume Pipe/PVC Pipe/Culvert in 3 place in Rogda and Pakaria, Akaltara	2.00	0.14	Completed CHC Akaltara
	Pipe Line/Submersible Pump Installtion	Pipe Line Expansion/Submersible Pump/ Borewell/ Hand Pump Installtion/ Pipe Line Repairing- Nariyara, Banahil, Latiya 2450 Mtr	25.60	22.11	Completed 2450 Meter



KSK Mahanadi Power Company Limited

CSR Budget for 2016-17

Sr. No.	Focus Area	Unit	Budget Amount (In Crore)	Amount Spent (In Crore)	Completed / In Progress
D.	Infrastructure Development				
5	Construction of Pump House	Const. of 02 Pump house for Water Overhead Tank in Murlidih and Pakariya	4.00	0.00	
6	Construction of Pond Steps	Construction of 6 Pond Steps in villages of Nariyara, Amora, Murlidih, Sheonarayan	8.93	0.00	
7	Construction of Bazaar Chabutara and Shop at Market Places in power plant area	Construction of Bazar Chabutara at Nariyara	8.00	0.00	
8	Construction of Funeral Shed, Platform, Boundary Wall, Concretized shed	Construction of 04 Concretized Shed in Taroud, Amora, Basantpur, Nariyara	7.00	4.98	Completed 02 villages
		Const. of Boundary wall of Mangal Bhawan constructed for SCs/STs in Nariyara village	5.00	16.50	Completed 2 boundary wall
		Construction of Chabutara at Gudipara of Amora	1.70	0.00	
		Construction of 02 Funeral Shed	5.50	0.00	
9	Construction and Development of Mini Stadium	RCC Sitting Arrangements & Leveling of Play ground Mini Staidum Taroud , Akaltara Dongakahrod and Jhalmala	6.00	42.13	Completed Mini Stadium Taroud
		Construction of Boundarywall of Play ground of Latiya	5.00	0.00	
		High Mast Lamp installation through Solar Lamp - 4 Nos(CREDA) in villages of Nariyara, Taraud, and Basantpur	16.00	0.00	
10	Retaining Wall Construction and Beutification of ponds	Retaining Wall Construction and Beutification of ponds in Dongakahrod	9.31	0.40	Completed



KSK Mahanadi Power Company Limited

CSR Budget for 2016-17

Sr. No.	Focus Area	Unit	Budget Amount (In Crore)	Amount Spent (In Crore)	Completed/ In Progress
D.	Infrastructure Development				
11	Construction and beautification of Square (Chowk)	03 Squares in Taraud, Banahil and Pakariya	13.00	0.15	Completed
12	Development of Land Escape and Gardening and maintainance	Construction of Vaternary Hospital /Construction of Kanji House at Village Nariyara	5.00	8.79	Completed
		Development of Tree plantation in Pakariya (Fencing Boundary, Security, Developemnt etc.) & Garden Development work at Janjgir & Taroud	15.00	2.43	Completed 1 Garden
		Beautification of 04 Cultural stage and Jait khambh in villages of Amora, Rogda, Murlidih	5.00	0.00	
13	Road signage, speed breaker for visibility & Welcome Gate	4 Welcome Gates/Statue Fitting in Amora, Dongakahrod, Aklatara and Mulmula	8.00	1.71	Completed
Sub-Total (D)			395.41	155.44	



KSK Mahanadi Power Company Limited

CSR Budget for 2016-17

Sr. No.	Focus Area	Unit	Budget Amount (In Crore)	Amount Spent (In Crore)	Completed/ In Progress
E.	Cultural & Community Support				
1	Construction, Repairing and renovation of Temples	in Villages of Amora, Latiya and Jhalmala	9.55	0.69	Completed 03 Temples
2	Donation to organize Religious Activities (Ganesh Puja, Durgotsava, Vijayadashmi, Nawadha, Gurughasidas & Kabir Jayanti etc.)	In villages of Nariyara, Amora, Murlidih, Taraud, Rogda, Banahil, Latiya, Pakaria and Dongakahrod	5.00	0.69	Completed 59 committees
3	Help to Cultural and Creational Activities	in villages of Nariyara, Taraud, Dongakahrod	5.00	15.75	Completed
4	Help to Promote Games and Sports Development activities	In villages of Nariyara, Taraud, Rogda, Murlidih and Jhalmala	7.25	2.56	Completed 06 villages
5	Support to Disaster Management Activities	in Jhalmala and Mulamula villages	5.00	0.00	
Sub-Total (E)			31.8	19.69	



KSK Mahanadi Power Company Limited

CSR Budget for 2016-17

Sr. No.	Focus Area	Unit	Budget Amount (In Crore)	Amount Spent (In Crore)	Completed/ In Progress
F.	Miscellaneous (Unplanned Activities)				
1	Support of Vehicle for CSR Activities	Jhalmala village	4.00	0.00	
2	Stationary & Other Expenses	Mulmula village	0.50	0.00	
3	Meeting and Training Expenses	Jhalmala village	0.05	7.41	Completed
4	Volunteers Honorarium/Tour Expenses	Jhalmala village	0.82	0.00	
5	Miscellaneous activities/unplanned activities	Jhalmala village	9.64	0.00	
Sub-Total (F)			15.01	7.41	
	Grand Total		865.00	246.82	
	Capital		809.45	220.57	
	Recurring		55.55	26.25	



KSK Mahanadi Power Company Limited

CSR Budget- 2017-18

Sr. No.	Focus Area	Unit	Budget Amount (In Crore)	Amount Spent (In Crore)	Completed / In Progress
A. Education & Capacity Building					
1	Construction of Public School/Industrial Training institute/Skill Development Centre/Capacity Building etc.	Expenses for ITI Training & Higher Education to 06 Student's	125.00	1.19	Completed 06 Student's
2	Scholarships to Students of power plant area and local area	Students of High and Higher Secondary school Level in villages of Nariyara, Taround, Amora, Latiya, Pakariya and sheonarayan, Basantpur and Dongarkahroud	2.75	0.00	
3	Sports items distribution and Sports Development activities in villages power plant area and local area	Distribution of sports material to 15 Schools in villages of Nariyara, Taroud, Murlidih, Latiya, Pakariya, Sheonarayna, Basantpur	5.25	0.00	
4	Renovation of Govt. Schools like Toilets for Girls, Library, Compound wall, Play Ground, Drinking water, E-Learning Classes, Electric Facilities Extension like fan, electrical wiring etc.	Support to ECO Clubs and cultural programs in Govt. schools(Swachh Bharat Abhiyan) in villages in villages of Nariyara, Taround	2.00	0.39	Completed
		Construction and repairing of Bio Tiolet in 10 Schools in villages of Nariyara, Amora, Banahil, Dongakahrod and Basantpur	6.20	5.00	
		Repairing of Kitchen Shed/Cultural Shed at Govt. Priamry & Middle School Rogda and Latiya	2.50	1.31	Completed 1 Cultural Shed
		Renovation of 01 School building like flooring, plaster, door, window, gate etc. at Nariyara & Rogda	4.00	0.71	Completed 3 School
5	Establishment of 03 Training Centres in local area		5.25	0.00	
Sub-Total (A)			152.95	8.60	



KSK Mahanadi Power Company Limited

CSR Budget- 2017-18

Sr. No.	Focus Area	Unit	Budget Amount (In Crore)	Amount Spent (In Crore)	Completed / In Progress
B.	Health Care				
1	Infrastructure development of Govt. Health Centers and Anganwari Centres in power plant area	Renovation of 3 anganwadi Centers in Amora, Banahil, Murlidih, Sheonarayan, Basantpur and Dongakahrod	3.00	0.00	
		Expenses for Martury Van to Nagar Palika Parishad Akaltara	6.00	0.00	
2	Continuation of mobile dispensary (Diesel & Maintenance and Consultancy fee, medicines for health camp)	1 Doctor, 1 Nurse, 1 Compounder, 6 Drivers in villages of Nariyara, Tarod, Amora, Rodga, Banahil, Murlidih, Latiya, Pakariya, Sheonarayan, Basantpur and Dongakahrod	3.60	6.55	Completed
3	Medicine for Mobile Medical Camps and Honorarium of Para Medical Staffs -240 Rural Health Camps	240 Rural Health Camps in Nariyara, Tarod, Amora, Rodga, Banahil, Murlidih, Latiya, Pakaria, Sheonarayan, Basantpur and Dongakahrod	4.00	12.73	Completed 223 Health Camp
4	Special Health Camps - Eye Camps, Child Health Camps, Family planning camps, Tuberculosis, Leprosy eradication, Support for medical treatment to needy person	Mega Health Camps at Podi dalha Ashram	0.40	2.00	Completed 4 Mega Health Camp
5	Expansion of Pipe Line and strengthening Nal Jal Yojna - 28978 Meter	Pipe Line Expansion Nariyara-300 Mtr	3.60	3.91	Completed 300 Meter
		Pipe Line Expansion Amora-700 Mtr	8.40	0.00	
		Pipe Line Expansion Banahil 525 Mtr	6.30	7.10	Completed 525 Meter
		Pipe Line Expansion Rodga 500 Mtr	6.00	0.00	
		Pipe Line Expansion Murlidih-800 Mtr	9.60	0.00	
		Pipe Line Expansion Latiya-750 Mtr	9.00	0.00	
		Pipe Line Expansion Pakariya-1000 Mtr	12.00	0.00	
		Pipe Line Expansion Donga Kohroud-800 Mtr	9.60	0.00	
		Pipe Line Expansion Other Villages-309 Mtr	3.71	0.00	



KSK Mahanadi Power Company Limited

CSR Budget- 2017-18

Sr. No.	Focus Area	Unit	Budget Amount (In Crore)	Amount Spent (In Crore)	Completed / Progress In
B.	Health Care				
6	Construction of Drainage Line in concerning villages -7220 Meter	Drainage Construction Nariyara- 1200 Mtr	13.80	0.00	
		Drainage Construction Taroud- 800 Mtr	9.20	0.00	
		Drainage Construction Rogda- 1000 Mtr	11.50	0.00	
		Drainage Construction Amora- 750 Mtr	8.63	0.00	
		Drainage Construction Murlideeh- 1000 Mtr	11.50	0.00	
		Drainage Construction Other villages-800 Mtr	9.20	0.00	
7	Installation of Submersible Pump/Tubewells/ Borewells/Hand pump installation at 08 Schools and Common places of power plant area	05 submersible Pumps in villages of Nariyara, Taroud, Rogda, Mulidih, Latiya	3.75	0.00	
		Installation of Submersible Pump through Solar Energy(CREDA)	13.20	0.00	
8	Installation of Drinking Water Facility in Rogda and Latiya	Installation of Water Cooler at Sub Health Center at Dongakahrod	1.00	0.00	
9	Installation of 10 New Handpumps	10 Hand Pumps in villages of Nariyara, Taroud, Murlidih, Pakaria, Sheonarayan, Basantpur & Dongakoroud	7.00	4.50	Completed 5 New Hand Pump
10	Repairing of 40 Default Handpumps	40 Handpumps in villages of Nariyara, Taroud, Amora, Rogda, Banahil	0.50	0.16	Completed
Sub-Total (B)			174.49	36.95	



KSK Mahanadi Power Company Limited

CSR Budget- 2017-18

Sr. No.	Focus Area	Unit	Budget Amount (In Crore)	Amount Spent (In Crore)	Completed/ In Progress
C.	Sustainable Development				
1	Help to Entrepreneurs for Small industry establishment in power plant area and local area	In villages of Nariyara, Tarod, Rodga, Pakaraia, Sheonarayana, Basantpur and Dongakahrod	5.00	0.50	Completed Adopt Home Program
2	Help to 13 WSHG for Income generation Activities	in villages of Amora, Banahil, Murlidih, Latiya, Sheonarayan, Basantpur and Dongakahrod	5.00	0.00	
3	Hybrid Seeds/Plants Distribution, Trainings for farmers for new Agriculture practices, Tree Plantation	installation of 20 No of Bio Gas thorough CREDA in villages of Nariyara, Taraud, Amora, Banahil, Latiya and Tree Plantation Under Hariyar Chhattisgarh Program	2.69	14.91	Completed Tree Plantation Hariyar C.G. Program- Pakariya & Taroud
4	Soil and Water Conservation programme like Stop dams, Pond construction and beautification of ponds	Pond Deepening in villages of Sheonarayan, Basantpur and Dongakahrod	5.00	0.00	
5		Retaining Wall Construction and Beautification of ponds in villages of Sheonarayan, Basantpur and Dongakahrod	5.00	0.00	
		Development of grazing land/ garden development	5.00	7.13	Completed 02 Garden
6	Animal Husbandry development like Dairy development, Breed development	in villages of Sheonarayan, Basantpur and Dongakahrod	2.00	0.00	
Sub-Total (C)			29.69	22.54	



KSK Mahanadi Power Company Limited

CSR Budget- 2017-18

Sr. No.	Focus Area	Unit	Budget Amount (In Crore)	Amount Spent (In Crore)	Completed/ In Progress
D.	Infrastructure Development				
1	Construction of 10 community building in power plant area	Community buildings in villages of Nariyara, Amora, Murlidih, Latiya, Pakaria, Dongakahrod, Basantpur and Jhalmala	40.00	0.58	Completed
2	Electricity Expansion for Power plant villages	Electrification of 60 Street Lights through Solar Energy(CREDA) in villages of Nariyara, Taroud, Amora, Rogda, Banahil, Latiya, Sheonarayan	31.41	0.00	
3	Construction of community and public Toilets	Construction of Toilets for 80 BPL families(Swachh Bharat Abhiyan) in villages of Rogda and Murlidih	5.00	0.00	
4	Construction of CC / WBM Road in four villages - 14540 Meter	CC Road Construction Nariyara- 800 Mtr	25.60	0.00	
		CC Road Construction Taroud- 210 Mtr	6.72	0.00	
		CC Road Construction Rogda-300 Mtr	9.60	0.00	
		CC Road Construction Amora- 300 Mtr	9.60	9.14	Completed 255 Meter
		CC Road Construction Murlideeh- 200 Mtr	6.00	0.00	
		CC Road Construction Pakariya- 300 Mtr	9.60	9.94	Completed 340 Meter
		Pipe Line Expansion Latiya village-300 Mtr	16.00	5.51	Completed 250 Meter
		Pipe Line Expansion Taroud village-1760 Mtr	9.60	8.95	Completed 1760 Meter
		Pipe Line Expansion/Submersible Pump/ Pipe Line Repairing- Nariyara 1707 Mtr	25.60	17.97	Completed 1707 Meter
		Repairing/Construction of WBM road in Nariyara	2.00	3.56	Completed 235 Meter
5	Construction of Pond Steps/ New Bore well drilling// Hand Pump Installtion/ work in WRD	Construction of 6 Pond Steps in villages of Nariyara, Amora, Murlidih, Sheonarayan/ New Borewell Drilling work in WRD	8.94	5.01	Completed 5 New Hand Pump

KSK Mahanadi Power Company Limited

CSR Budget- 2017-18

Sr. No.	Focus Area	Unit	Budget Amount (In Crore)	Amount Spent (In Crore)	Completed/ In Progress
D.	Infrastructure Development				
6	Construction of Bazaar Chabutara and Shop at Market Places in power plant area	Construction of Bazar Chabutara at Nariyara & Construction of Cycle/Motor Cycle Stand with Shed in common places	8.00	8.56	Completed CHC Akaltara
7	Construction of Funeral Shed, Platform, Boundary Wall, Concretized shed	Construction of 04 Concretized Shed in villages Amora, Banahil, Pakaraia, and Basaantpur	8.00	0.00	
		Construction of Chabutara at Pakariya	1.70	0.00	
		Construction of 02 Funeral Shed/Construction of Car Stand with Shed in common places	5.50	6.26	Completed CHC Akaltara
8	Construction and Development of Mini Stadium	Leveling and pitch construction of Play ground Taroud	6.00	3.20	Completed 1 Stadium Taroud
		Construction of Boundarywall of Play ground at Village Murlidih	5.00	1.70	Completed 1 Boundary wall
		High Mast Lamp installation through Solar Lamp - 4 Nos(CREDA) in villages of Nariyara, Taroud, Banahil and Pakariya & Development of Mini Stadium - Taroud	16.00	17.47	Completed 1 Stadium Taroud
9	Jyoti Kalash room for Devsthal	Construction of Jyoti Kalsh Room for Dev Sthal at Basantpur	2.00	0.00	
10	Construction and beautification of Square (Chowk)	02 Squares in Nariyara and Basantpur	9.00	0.00	
11	Development of Land Escape and Gardening and maintainance	Beautification of 04 Cultural stage and Jait khambh in villages of Nariyara, Taroud, Amora, Latiya & Garden Development work at Janjgir & Taroud	5.00	0.33	Completed 1 Garden
12	Road signage, speed breaker for visibility & Welcome Gate	4 Welcome Gates in villages of Jhalmala, Mulmula, Akaltara and Karoud	8.00	0.73	Completed 6 No. Road Signage
Sub-Total (D)			279.87	98.91	



KSK Mahanadi Power Company Limited

CSR Budget- 2017-18

Sr. No.	Focus Area	Unit	Budget Amount (In Crore)	Amount Spent (In Crore)	Completed/ In Progress
E.	Cultural & Community Support				
1	Construction, Repairing and renovation of Temples	In villages of Nariyara, Amora, Jhalmala, Mulmula	10.00	3.42	Completed 4 Temple
2	Donation to organize Religious Activities(Ganesh Puja, Durgotsava, Vijayadashmi, Nawadha, Gurughasidas & Kabir Jayanti etc.)	In villages of Nariyara, Tarod, Rodga,Banahil Murlidih, Latiya, Pakaraia, Sheonarayana, Basantpur and Dongakahrod	4.00	1.50	Completed 59 committees
3	Help to Cultural and creational Activities	in villages of Nariyra, Taroud, Murlidih, Basantpur and Jhalmala	8.00	1.27	Completed
4	Help to Promote Local Games and Sports Development activities	In Nariyara, Amora, Rogda and Taroud	2.00	3.06	Completed 06 villages
5	Support to Disaster Management Activities	In villages of Nariyara, Tarod, Rodga,Banahil Murlidih, Latiya, Pakaraia, Sheonarayana, Basantpur and Dongakahrod	10.00	0.00	
Sub-Total (E)			34.00	9.25	



KSK Mahanadi Power Company Limited

CSR Budget- 2017-18

Sr. No.	Focus Area	Unit	Budget Amount (In Crore)	Amount Spent (In Crore)	Completed / In Progress
F.	Miscellaneous (Unplanned Activities)				
1	Support of Vehicle for CSR Activities	Jhalmala village	1.00	0.00	
2	Stationary & Other Expenses	Mulmala village	0.50	0.00	
3	Meeting and Training Expenses	Jhalmala village	0.50	5.88	
4	Volunteers Honorarium/Tour Expenses	Jhalmala village	1.00	0.00	
5	Miscellaneous activities/unplanned activities	Jhalmala village	4.00	2.39	
Sub-Total (F)			7.00	8.27	
	Grand Total		678.00	184.52	
	Capital		635.00	153.84	
	Recurring		43.00	30.68	



Annexure-XXXII

Dt.12.10.2024

Photos of Water sprinkling in the outside areas (NH, Village roadsides) of M/s KMPCL.





Annexure-XXXIII



Coal Procurement and Transportation Details- M/s KSK Mahanadi Power Company Limited

Period-Apr'24 to Sep'24

Months	Coal Received by Road			Coal Received by Rail				Total
	Linkage	E-Auction	Open Market Coal	Linkage	E-Auction	Open Market Coal	Import Coal	
Apr-24	34410	0	0	472262	0	0	0	506672
May-24	56557	0	3985	548012	0	0	0	608554
Jun-24	55002	0	36241	537039	0	0	0	628282
Jul-24	55812	0	27703	326422	0	0	0	409937
Aug-24	26465	0	46851	288389	0	19350	0	381055
Sep-24	65426	0	28469	351306	0	59350	0	504551
Total	293672	0	143248	2523431	0	78700	0	3039051

Annexure-XXXIV

**M/s KSK Mahanadi Power Company Limited,
Village-Nariyara, Tehsil-Akaltara, District-Janjgir-Champa, C.G.**

Dt.10.10.2024

Details of CECB NOC issued to KMPCL for fly ash utilization in Low-lying area and abandoned Mines reclamation

SN.	Name of Village	Khasara Number	Total area	CECB NOC No.& Date	Status of site as on date	After using fly ash, for what purpose is the site currently used/will it be used? Send clear information in this regard.
1	Village- Khaira, Jairamnagar, Tehsil-Masturi, District-Bilaspur, (CG.)	759/1, 759/4, 759/3, 760, 761, 763, 762	2.829 Ha.	598/RO/CECB/2021, Bilaspur, Dt.20/07/2021	Work completed	Land development to avoid road accidents.
2	Village- Khaira, Jairamnagar, Tehsil-Masturi, District-Bilaspur, (CG.)	764	0.733 Ha.	600/RO/TS/CECB/2021, Bilaspur, Dt.20-07-2021	Work completed	Land development to avoid road accidents.
3	Village- Jairamnagar, Tehsil-Masturi, District- Bilaspur, (CG.)	730/1	0.6070 Ha.	12351/RO/TS/CECB/2021, Bilaspur, 08/10/2021	Work completed	Reclamation of low-lying land. The landowner will use as per his convenience.
4	Village- Kirari, Tehsil-Masturi, District-Bilaspur, (CG.)	738/1	12 Acre	1252/RO/TS/CECB/2021, Bilaspur, Dt.11/10/2021	Work completed	Reclamation of low-lying land. The landowner will use as per his convenience.
5	Village- Kirari, Tehsil-Masturi, District-Bilaspur, (CG.)	738/1	12 Ha.	373/RO/TS/CECB/2022, Bilaspur, 25/05/2022	Work completed	
6	Village- Bhanesar, Tehsil-Masturi, District-Bilaspur, (CG.)	110/1	16.4470 Acre	1269/RO/TS/CECB/2021, Bilaspur, Dt.12/10/2021	In-progress	Reclamation of low-lying land. The landowner will use as per his convenience.
7	Village- Bhadura, Tehsil-Masturi, District-Bilaspur, (CG.)	399/3, 399/4, 407/3, 406/6, 399/9, 404/3, 407/2, 407/1, 416/4,	2.708 Ha.	1270/RO/TS/CECB/2021, Bilaspur, Dt.12/10/2021	Work completed	Need of Panchayat for village development

**M/s KSK Mahanadi Power Company Limited,
Village-Nariyara, Tehsil-Akaltara, District-Janjgir-Champa, C.G.**

		406/1, 413, 408/2, 407/6, 407/7, 408/1				
8	Village- Jairam Nagar, Tehsil-Masturi, District-Bilaspur, (CG.)	252/1	0.705 Ha.	1287/RO/TS/CECB/2021, Bilaspur, Dt.18/10/2021	Work completed	For storage of materials.
9	Village- Khudubhata, Tehsil-Masturi, District-Bilaspur, (CG.)	1/1	06 Acre.	1350/RO/TS/CECB/2021, Bilaspur, Dt.25/10/2021	Work completed	For construction of cowsheds.
10	Village- Bhilai, Tehsil-Masturi, District-Bilaspur, (CG.)	233/1	03 Ha	1393/RO/TS/CECB/2021, Bilaspur, Dt.28/10/2021	Work completed	Reclamation of low-lying land. The landowner will use as per his convenience.
11	Village- Mohatara, Tehsil-Masturi, District-Bilaspur, (CG.)	186/1	4.856 Ha	1613/RO/TS/CECB/2021, Bilaspur, Dt. 22/11/2021	Work completed	Reclamation of low-lying land. The landowner will use as per his convenience.
12	Village- Paraghat, Tehsil-Masturi, District-Bilaspur, (CG.)	525/1	15 Ha.	1732/RO/TS/CECB/2021, Bilaspur, 01/12/2021	Work completed	For developmet of Plantation.
13	Village- Nariyara, Tehsil-Akaltara, District-Bilaspur, CG.(JK Fly ash Bricks)	445/17	0.162 Ha.	1995/RO/TS/CECB/2021, Bilaspur, Dt.27/12/2021	Work completed	For establishment of Brick manufacturing unit.
14	Village- Khaira, Tehsil-Masturi, District-Bilaspur, (CG.) (Badri Prasad)	784/1d	0.451 Ha	2076/RO/TS/CECB/2022, Bilaspur, Dt. 06/01/2022	Work completed	For establishment of Brick manufacturing unit.
15	Village-Kapan, Tehsil-Akaltara, District-Janjgir-Champa, (CG.)	11/1	0.1545 Ha.	2174/RO/TS/CECB/2022, Bilaspur, Dt. 19/01/2022	Work completed	For establishment of MTW Tyre Industry.
16	Village-Paraghat, Tehsil-Masturi, District-Bilaspur, (CG.)	524/1	0.5 Ha.	2492/RO/TS/CECB/2022, Bilaspur, Dt. 25/02/2022	Work completed	For developmet of Plantation.
17	Village- Bhanesar, Tehsil-Masturi, District-Bilaspur, (CG.)	103/13, 103/15, 103/16, 103/36	2.31 Acr.	1787/RO/TS/CECB/2022, Bilaspur,Dt.16/11/2022	Work completed	For establishment of Coal Washery.
18	Village- Bhainso, Tehsil-Masturi, District-Bilaspur, (CG.)	1607/2	2.278 ha.	214/RO/CECB/2022, Bilaspur, Dt.05/05/2022	Work completed	For village development.
19	Village-Mauhadih, Tehsil-Akaltara, Dist.-Janjgir Champa, (CG.)	246/1, 247	0.174 Ha	820/RO/CECB/2022, Bilaspur, Dt.18/07/2022	In-progress	For ddevelopment of Industry.

**M/s KSK Mahanadi Power Company Limited,
Village-Nariyara, Tehsil-Akaltara, District-Janjgir-Champa, C.G.**

20	Village- Nariyara, Tehsil-Akaltara, Dist.-Janjgir Champa, (CG.)	448/9	0.061 Ha	877/RO/CECB/2022, Bilaspur, Dt.22/07/2022	Work completed	For establishment of Brick Plant.
21	Village- Sukulpara, Tehsil-Pamgarh, Dist.-Janjgir Champa, (CG.)	1294/1	0.2080 Ha	1027/RO/CECB/2022, Bilaspur, Dt.08/08/2022	Work completed	Owner will use land as per his own requirement.
22	Village- Bhadaura, Tehsil-Masturi, Dist.-Bilaspur, (CG.)	422	2.0 Ha	822/RO/CECB/2022, Bilaspur, Dt.18-07-2022	Work completed	for development of Tree Plantation.
23	Village- Jairam nagar Tehsil-Masturi, Dist.-Janjgir-Champa, (CG.)	759/1, 759/3, 759/4, 760, 761, 762, 763	2.829 Ha.	1105/RO/CECB/2022, Bilaspur, Dt.23/08/2023	Work completed	To avoid road accidents.
24	Village- Taurod , Tehsil-Akaltara, Dist.-Janjgir Champa	2111	4 Acr.	3003/RO/CECB/2023, Bilaspur, Dt.28/02/2023	Work completed	For establishment of Stone Crusher Plant.
25	Village- Mudpar, Tehsil-Pamgarh, Dist.-Janjgir Champa, (CG.)	252/4, 252/5,	0.64 Ha	1277/RO/CECB/2022, Bilaspur-, Dt.09/09/2022	Work completed	For establishment of Rice Mill.
26	Village- Pauna, Tehsil- Akaltara, Dist.-Janjgir Champa	11/1,	3.147 Ha	3146/RO/CECB/2023, Bilaspur, Dt.13/03/2023	Work completed	For village development
27	Village- Kalyanpur, Tehsil-Akaltara, Dist.-Janjgir Champa, (CG.)	779/1,	17.5 Ha.	3246/RO/CECB/2023, Bilaspur, Dt.20/10/2023	In-progress	For village development
28	Village- Kirari, Tehsil- Akaltara, Dist.-Janjgir Champa, (CG.)	116/1, 116/32, 116/33, 116/37	3.23 Acr.	3598/RO/CECB/2022, Bilaspur, Dt.28/11/2023	In-progress	Owner will use land as per his own requirement.
29	Village- Murlidih, Tehsil-Akaltara, Dist.-Janjgir Champa, (CG.)	1420/5, 1426/2, 1429/2, 1455/1	0.80 Acr.	1661/RO/CECB/2022, Bilaspur, Dt.02/11/2022	Work completed	For agricultural planning.
30	Municipal Council Akaltara, Ward No. 18, Tehsil-Akaltara, District-Janjgir-Champa (CG.)	633	8.09 Ha	1680/RO/CECB/2022, Bilaspur, Dt.04-11-2022	In-progress	For village development
31	Village- Sukulpara, Nagar Panchayat Kharaud, Tehsil - Pamgarh, District - Janjgir-Champa, (CG.)	275, 360	0.353 Acr.	1686/RO/CECB/2022, Bilaspur, Dt.07-11-2022	In-progress	To avoid road accidents.

**M/s KSK Mahanadi Power Company Limited,
Village-Nariyara, Tehsil-Akaltara, District-Janjgir-Champa, C.G.**

32	Village- Kharaud, Tehsil- Pamgarh, District-Janjgir-Champa, (C.G.)	1141,	0.7170 Ha.	1768/RO/CECB/2022, Bilaspur, Dt.16-11-2022	Work not yet started	--
33	Village- Murlidih, Tehsil- Akaltara, Dist.-Janjgir Champa, (C.G.)	1265/1 d	5.00 Ha.	1836/RO/CECB/2022, Bilaspur, Dt.22/11/2022	Work completed	For construction of Warehouse.
34	Village- Latiya, Tehsil- Akaltara, Dist.-Janjgir Champa (C.G.)	364/2, 365/2, 365/3	0.684 Ha.	2756/RO/CECB/2023, Bilaspur, Dt.07/02/2023	In-progress	Owner will use Land as per his own requirement.
35	Village- Khokara, Tehsil- Janjgir, Dist.-Janjgir Champa, (C.G.)	3191/1, 3366/1	15.228 Ha.	493/RO/CECB/2023, Bilaspur, Dt.01/05/2023	Work completed	For construction of Warehouse.
36	Gram Panchayat-Pakariya (Jhulan), Tehsil- Akaltara, Dist.-Janjgir Champa, (C.G.)	1857/2, 1880/1, 1765/1d	5.964 Ha	493/RO/CECB/2023, Bilaspur, Dt.01/05/2023	In-progress	For development of Vegetable Market.
37	Village- Banahil, Tehsil- Akaltara, Dist.-Janjgir Champa, (C.G.)	209/10	0.1620 Ha.	3150/RO/CECB/2023, Bilaspur, Dt.13/03/2023	Work not yet started	For commercial purpose (shopping mall development)
38	Village- Taroud, Tehsil- Akaltara, Dist.-Janjgir Champa, (C.G.)	886/1d	1.44 Ha.	3329/RO/CECB/2023, Bilaspur, Dt.28/03/2023	Work not yet started	For Personal use
39	Village- Cheuidh, Tehsil- Pamgarh, Dist.-Janjgir-Champa, (C.G.)	111/8, 111/22, 112/2, 112/4, 112/5, 112/6, 112/7, 112/8, 112/9, 113, 114, 256/1, 1299/1x, 1314/2	5.63 Acr.	3596/RO/CECB/2023, Bilaspur, Dt.28/11/2023	In-progress	For agricultural planning
40	Village- Amora, Tehsil- Akaltara, Dist.-Janjgir Champa, (C.G.)	754/1	0.19 Ha.	491/RO/CECB/2023, Bilaspur, Dt.01/05/2023	In-progress	For Construction of House.
41	Village- Darrighat, Tehsil- Masturi, Dist.-Bilaspur, (C.G.)	22/11, 22/12, 22/13, 22/14, 22/49, 34/9, 34/12	5.65 Acr.	491/RO/CECB/2023, Bilaspur, Dt.01/05/2023	In-progress	Owner will use Land as per his own requirement.
42	Village- Putpura, Tehsil- Janjgir, Dist.-Janjgir Champa, (C.G.)	942/1, 942/2	0.684 Ha.	972/RO/CECB/2023, Bilaspur, Dt.19/06/2023	In-progress	For construction of Engineering College.
43	Village- Banari, Tehsil- Janjgir, Dist.-Janjgir-Champa, (C.G.)	1958/3, 1958/4, 1965/1, 1965/3, 1967/1, 1968, 1971/3, 1971/6, 1971/8, 1971/12, 1968/3, 1986/4, 2028/1	2.98 Ha.	3566/RO/CECB/2023, Bilaspur, Dt.22/11/2023	In-progress	For construction of Private Ware house

**M/s KSK Mahanadi Power Company Limited,
Village-Nariyara, Tehsil-Akaltara, District-Janjgir-Champa, C.G.**

44	Village- Limtara, Tehsil- Masturi, Dist.-Bilaspur, (C.G)	59, 59/1	25 Ha.	972/RO/CECB/2023, Bilaspur, Dt.19/06/2023	In-progress	Village deployment
45	Village- Jhulan Pakariya, Tehsil-Pamgarh, Dist.-Janjgir-Champa, (C.G.)	95/1, 95/3, 95/4, 95/12, 95/13, 95/14, 95/15, 95/16, 96/1	1.405 Ha.	3246/RO/CECB/2023, Bilaspur, Dt.20/10/2023	In-progress	Owner will use Land as per his own requirement.
46	Village- Sankar, Tehsil-Akaltara, Dist.-Janjgir-Champa, (C.G)	107/1	11.319 Ha.	2143/RO/CECB/2023, Bilaspur, Dt.31/07/2023	Work completed	For construction of Panchayat Office.
47	Village- Akaltara, Tehsil-Akaltara, Dist.-Janjgir-Champa, (C.G)	1173/20	0.11 Ha	1755/RO/CECB/2023, Bilaspur, Dt.25/07/2023	Work completed	For construction of Dhaba & Restaurant.
48	Village- Darrighat, Tehsil-Masturi, Dist.-Bilaspur, (C.G)	38/6, 38/8, 38/9, 38/10, 38/12, 38/13, 38/14, 38/15, 40/53,	1.06 Ha.	1755/RO/CECB/2023, Bilaspur, Dt.25/07/2023	In-progress	Plot for sale
49	Village- Kirari, Tehsil- Akaltara, Dist.-Janjgir-Champa, (C.G)	5/1	3.72 Acr.	1755/RO/CECB/2023, Bilaspur, Dt.25/07/2023	In-progress	For construction of Ware House
50	Village- Kharod, Tehsil-Pamgarh, Dist.-Janjgir-Champa, (C.G)	242/1, 242/2, 812/2, 1178/1, 1053/1, 1053/2,	3.41 Ha	1755/RO/CECB/2023, Bilaspur, Dt.25/07/2023	In-progress	To avoid road accidents.
51	Plot No.-124, Industrial area, Kapan Tehsil- Akaltara, Dist.-Janjgir-Champa, (C.G)	11/1	0.0625 Ha.	2581/RO/CECB/2023, Bilaspur, Dt.23/08/2023	In-progress	For establishment of MTW Tyre Industries
52	Village- Mohatara, Tehsil-Masturi, Dist.-Bilaspur, (C.G)	138/1x	0.52 Acr.	3244/RO/CECB/2023, Bilaspur, Dt.20/10/2023	Work not yet started	For development of Water park
53	Village- Parashai (Nalla), Tehsil-Akaltara, Dist.-Janjgir-Champa, (C.G)	391/1, 391/2	1.73 Acr.	3244/RO/CECB/2023, Bilaspur, Dt.20-10-2023	Work completed	For construction of Warehouse
54	Village- Jairam Nagar, Tehsil-Masturi, Dist.-Bilaspur, (C.G)	766/1, 766/3	0.781 Ha.	3244/RO/CECB/2023, Bilaspur, Dt.20/10/2023	Work completed	For construction of Rice mill
55	Village- Nariyara, Tehsil-Akaltara, Dist.-Janjgir Champa, (C.G)	1700, 1701/3	2.27 Acre	3244/RO/CECB/2023, Bilaspur, Dt.20/10/2023	Work completed	For construction of Warehouse

**M/s KSK Mahanadi Power Company Limited,
Village-Nariyara, Tehsil-Akaltara, District-Janjgir-Champa, C.G.**

56	Village- Sukulpara, Kharoud Tehsil- Pamgarh, Dist.-Janjgir Champa, (C.G)	833	0.283 Ha.	3564/RO/CECB/2023, Bilaspur, Dt.22/11/2023	In-progress	Owner will use Land as per his own requirement.
57	Village- Sukulpara, Kharoud Tehsil- Pamgarh, Dist.-Janjgir Champa, (C.G)	719, 724, 725, 727, 728, 729/1, 729/2, 731/2, 732/2, 742/2, 742/3, 743/2, 744, 745, 1277/1, 752, 747, 742/4, 739/3, 739/6, 742/5, 739/5, 120, 121/1, 730, 731/1, 743/1	3.083 Ha.	3564/RO/CECB/2023, Bilaspur, Dt.22/11/2023	In-progress	For Building project
58	Gram- Taga, Tehsil- Akaltara, Dist.: Janjgir-Champa, (C.G)	176/1d	13 Acre	3578/RO/CECB/2023, Bilaspur, Dt. 23-11-2023	In-progress	For construction of Panchayat office.
59	Village- Deoraha Tehsil- Janjgir, Dist.-Janjgir Champa, (C.G)	92, 93, 94, 95, 96/1, 96/2	2.214 Acr.	3635/RO/CECB/2023, Bilaspur, Dt.30-11-2023	In-progress	Mines Back filling
60	Village- Mohatara, Tehsil- Masturi, Dist.-Bilaspur, (C.G)	226/16	0.454 Ha.	4253/RO/CECB/2023, Bilaspur, Dt.20/12/2023	In-progress	For establishment of Stone Crusher Plant.
61	Village- Dodki, Tehsil- Masturi, Dist.-Bilaspur, (C.G)	34/1	12.752 Ha.	4566/RO/CECB/2024, Bilaspur, Dt.18/01/2024	In-progress	For construction of Panchayat office.
62	Village- Khokhra, Tehsil-Janjgir, (Police Ground of Protected Center Janjgir), District-Janjgir- Champa (C.G)	2666/02, 2667/01, 2668/01, 2669/01	3.0 Acr.	4780/RO/CECB/2024, Bilaspur, Dt.02/02/2024	Work completed	For development of playground of the police station.
63	Village- Kutharabod, Tehsil- Pamgarh, Dist.-Janjgir Champa	301/46	0.607 Ha.	4831/RO/CECB/2024, Bilaspur, Dt.05-02-2024	In-progress	Reclamation of Low-lying area for personal use.
64	Village- Sukulpara Kharoud, Tehsil-Pamgarh, District- Janjgir- Champa (C.G)	207/1, 216/1d, 726/1, 2850/1	25.618 Ha.	5089/RO/CECB/2024, Bilaspur, Dt.16/02/2024	In-progress	To avoid road accidents.
65	Village- Masturi, Tehsil-Masturi, District-Bilaspur, (C.G)	593/1, 593/3, 593/4	0.634 Ha.	5585/RO/CECB/2024, Bilaspur, Dt.15/03/2024	In-progress	Mines Backfilling
66	Village- Banari, Tehsil-Janjgir, District-Janjgir-Champa, (CG.)	1860/14, 1860/15	0.607 Ha.	473/R.O./T.S./CECB/202 4, Bilaspur, Dt.15/05/2024	In-progress	For Building Project.

**M/s KSK Mahanadi Power Company Limited,
Village-Nariyara, Tehsil-Akaltara, District-Janjgir-Champa, C.G.**

67	Village- Khisora Tehsil- Akaltara, Dist.-Janjgir Champa, (CG.)	1324/1, 1324/3, 1324/4, 1494/2, 1494/4, 1494/5	1.416 Ha.	471/R.O./T.S./CECB/2024, Bilaspur, Dt.15/05/2024	In-progress	Construction of wire house (Plinth filling)
68	Village- Jairamnagar, Tehsil-Masturi, District- Bilaspur, (CG.)	784/5	0.8090 Ha.	757/R.O./T.S./CECB/2024, Bilaspur, Dt. 06/06/2024	In-progress	Gardening & Nursery
69	Village-Latiya, Tehsil-Akaltara, Dist.-Janjgir-Champa (CG.)	362/1, 364/1, 365/1 & 368/1	1.441 Ha.	1378/RO/CECB/2024, Bilaspur, Dt. 25/07/2024	In-progress	Land owner will use this land for his personal purpose
70	Industrial Zone Kapan, Plot No:- 53 & 54, Tehsil- Akaltara, Dist.- Janjgir Champa, (CG.)	11/1	0.30 Ha.	1743/RO/CECB/2024, Bilaspur, Dt.22/08/2024	In-progress	Land owner will use this land for his personal purpose
71	Village- Pakariya, Tehsil-Akaltara, Dist.-Janjgir Champa, (CG.)	985/1, 985/2, 985/3, 985/4	1.1360 Ha.	1726/RO/CECB/2024, Bilaspur, Dt.22/08/2024	In-progress	Commercial purpose (Bricks plant)
72	Village- Jairamnagar, Tehsil-Masturi, District- Bilaspur, (CG.)	744/1, 744/2	0.259 Ha.	2185/RO/CECB/2024, Bilaspur, Dt.30/09/2024	Not yet started	For Personal use

Annexure-XXXV

Dt. 22.10.2024

Photographs of Water sprinkling at fly ash utilization sites
(Abandoned Mines & Low-lying areas)



Annexure-XXXVI

Top Soil cover after reclamation of Low-lying /Mines area with Fly Ash.

Pramod Kurrey Low Lying Area, at village- village-Mudpar, Pamgarh, Janjgir-Champa



Sanat Kesharwani Low-Lying area, at village-Sukalpara, Tehsil-Pamgarh, Dist.-Janjgir Champa



Anand Khemka Mine at village-Taraud, Akaltara, Dist.-Janjgir-Champa



Low-lying (Khokhara Police Ground) area at Janjgir, dist. Janjgir-Champa



Low-lying area (Shyam Sunder) at village-Nariyara, Jhalmala Road, Janjgir-Champa



Low-lying area at village Murlidih (Panchram)



Low-lying area at village- Pauna, Akaltara, Dist-Janjgir-Champa



Low-lying area at village Sukulpara, Kharod (Basant Yadav)



Low-lying area at village Badura, , Masturi, Dist. Bilaspur (Ravi Sharma)



Low-lying area at village Badura, Masturi, Dist. Bilaspur (Parmeswar)





Low-lying area at village Khudubhata, Masturi, Dist. Bilaspur



Low-lying area at village Jairamnagar (Badriprasad)



Low-lying area at village-Kirari



Low-lying area at village-Paraghat



Low Lying Area at Village- Jairamnagar (Salasar)



Low Lying Area at Village- Khaira



Subodh Dhar Diwan Mine Quarry pit- low-lying area at village-Kirari



VP Mishra (Coalmen) low lying area at village-Jairam Nagar



Bhagwati Bai Karsh low lying area at village- Nariyara



Banari low laying area located at Banari



Dilaharan Low-lying area, Jairam Nagar



Virendra Pratap Mishra –Low lying area, Jairam Nagar



Paddy Storage Low-lying area, Akaltara

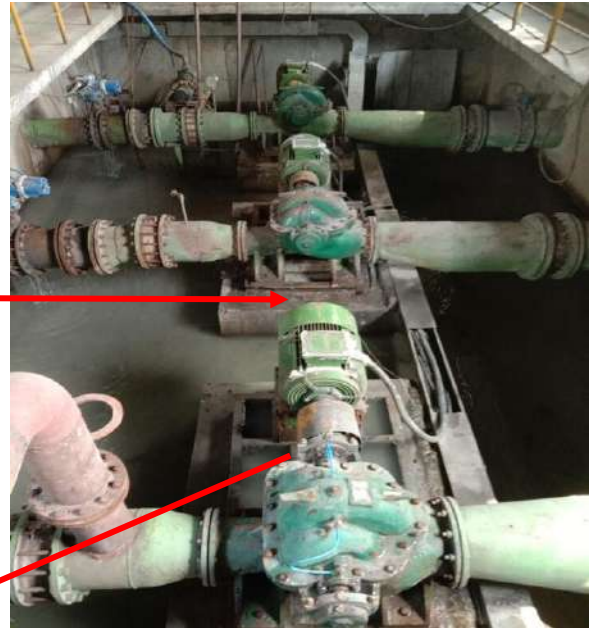


Paraghat Low-lying area, Masturi



Annexure-XXXVII

Photographs for Ash Water Sum Recovery System in KMPCL



Annexure-XXXVIII

कार्यालय कलेक्टर (खनिज शाखा) जांजगीर-चांपा (छ0ग0)

फोन नं: 07817-223917, फॅक्स: 07817-222228 Email: janjgirchampanining@gmail.com

क्रमांक/1381/ख.नि./ 2016

जांजगीर, दिनांक 10/11/2016

प्रति,

में0 एस. एस. इंटरप्राइजेस प्रा0 लि0
अकलतरा तह0 अकलतरा
जिला-जांजगीर चाम्पा (छ.ग.)

विषय :- फलाई ऐश पाटने के संबंध में।
संदर्भ :- आपका आवेदन पत्र दिनांक 06.10.2016

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विषयान्तर्गत आपको ग्राम लटिया तह0 अकलतरा के खसरा नंबर 647/1, 647/2, 647/6, रकबा 5.20 एकड़ क्षेत्र में अवधि दिनांक 24.01.2004 से 23.01.2014 तक के लिये निम्न श्रेणी चूनापत्थर उत्खनिपट्टा स्वीकृत था। जिसकी अवधि समाप्त हो चुकी है। उक्त खदान काफी गहरी 25 मीटर से अधिक होने का उल्लेख करते हुए आपके द्वारा पॉवर प्लांट से निकली वेस्ट राखड़ (फलाई ऐश) को उक्त गढ़दे में पाटने की अनुमति चाही गई है। इस हेतु आपको क्षेत्रीय कार्यालय छ0ग0 पर्यावरण संरक्षण मण्डल, बिलासपुर के पत्र क्रमांक 1204/क्षेका/ छ0ग0प.सं.मं./2016 बिलासपुर दिनांक 13.10.2016 से अनापत्ति सशर्त दी गई है।

अतः निम्नांकित शर्तों के पालन करते हुए फलाई ऐश पाटने हेतु अनापत्ति प्रदान की जाती है :-

1. Pollution विभाग की शर्तों का पूरी तरह पालन करना होगा।
2. फलाई ऐश परिवहन करते समय वाहन पूरी तरह से ढंककर ही परिवहन किया जावे तथा फलाई ऐश पर निरंतर पानी का छिड़काव करना होगा।
3. फलाई ऐश से गढ़दे की भराई के बाद उपरी सतह पर लगभग 02 फिट मिट्टी से सतह को समतल करना होगा।
4. किसी भी प्रकार की घटना/दुर्घटना होने पर उसकी संपूर्ण जिम्मेदारी आपकी होगी, तथा शासन/प्रशासन से किसी प्रकार की क्षतिपूर्ति/मुआवजा प्रदान नहीं किया जावेगा।
5. वर्षा के दौरान फलाई ऐश बहकर नदी/नाले (यदि हो तो) की ओर न जाये इसलिये समुचित व्यवस्था करना होगी।
6. किसी भी प्रकार की अनियमितता पाये जाने पर आपके विरुद्ध नियमानुसार कार्यवाही की जावेगी एवं समस्त जिम्मेदारी आपकी होगी।

(कलेक्टर महोदय द्वारा अनुमोदित)

2/6
8911116

खनि अधिकारी
जिला-जांजगीर चाम्पा (छ.ग.)

पृ0 क्रमांक/ /ख.नि./ 2016

जांजगीर, दिनांक

प्रतिलिपि,

1. पर्यावरण संरक्षण मण्डल व्यापार बिहार, बिलासपुर की ओर सूचनार्थ प्रेषित।
2. खनि निरीक्षक, जांजगीर जिला-जांजगीर चाम्पा की ओर सूचनार्थ प्रेषित।

खनि अधिकारी
जिला-जांजगीर चाम्पा (छ.ग.)



क्षेत्रीय कार्यालय,
छत्तीसगढ़ पर्यावरण संरक्षण मण्डल,
व्यापार विहार पं. दीनदयाल उपाध्याय पार्क के पास, बिलासपुर (छ.ग.)

e-mail: cecb.robilaspur@gmail.com Ph. No. 07752-261172

क्रमांक
प्रति,

1204/क्षेका/छ.ग.प.स.म./2016

बिलासपुर, दिनांक : 13/10/16

✓ खनि अधिकारी,
कार्यालय कलेक्टर (खनिज शाखा),
जिला-जांजगीर-चांपा (छ.ग.)

विषय:- ग्राम लटिया, तहसील-अकलतरा स्थित ख. नं. 647/1, 647/2, 647/6
रकबा-5.20 एकड़ क्षेत्र पर फलाई ऐश पाटने हेतु पर्यावरण सम्मति प्रदाय
बाबत।
संदर्भ:- आपका पत्र क्रमांक 1208/ख.नि./2016 दिनांक 06.10.2016

उपरोक्त विषयांतर्गत संदर्भित पत्र के परिपेक्ष्य में लेख है कि मेसर्स श्रीनिवासा एडिफाईड प्रा. लि., ग्राम-लटिया, तहसील-अकलतरा, ख. नं. 647/1, 647/2, 647/6 रकबा-5.20 एकड़, जिला-जांजगीर-चांपा को इस कार्यालय के पत्र क्रमांक 833 दिनांक 19.08.2016 को उक्त स्थल पर फलाई ऐश डिस्पोजल हेतु सशर्त अनुमति प्रदान की गई है।

आपके उपरोक्त संदर्भित पत्र के परिपेक्ष्य में दिनांक 06.10.2016 को उक्त भूमि ख. नं. 647/1, 647/2, 647/6, रकबा-5.20 एकड़ क्षेत्र को मेसर्स एस. एस. इंटरप्राइजेस, अकलतरा द्वारा क्रय कर ली गई है। अतः उक्त भूमि पर राखड़ अपवहन हेतु आपके द्वारा पर्यावरण सम्मति प्रदान करने हेतु लिखा गया है। इस परिपेक्ष्य में लेख है कि मेसर्स श्रीनिवासा एडिफाईड प्रा. लि. को जारी अनुमति के स्थान पर नाम परिवर्तन किया जाकर मेसर्स एस. एस. इंटरप्राइजेस को अनुमति दी जाती है। पत्र में उल्लेखित अन्य सभी शर्तें यथावत् रहेगी।

क्षेत्रीय अधिकारी,
छत्तीसगढ़ पर्यावरण संरक्षण मंडल
बिलासपुर (छ.ग.)



REGIONAL OFFICE,
C.G. ENVIRONMENT CONSERVATION BOARD,
VYAPAR VIHAR, NEAR Pt. DEEN DAYAL UPADHYAY PARK, BILASPUR (C.G.)
No. 833 /R.O./T.S./C.E.C.B./2016 Bilaspur, dated: 19/8/16

To,

M/s Shrinivasa Adified Pvt. Ltd.,
Village-Latia, Tehsil-Akaltara,
District- Janjgir-Champa (C.G.)

Sub:- Permission for disposal of fly ash in abandoned low grade lime stone quarry, of M/s Shrinivasa Adified Pvt. Ltd., Village-Latia, Tehsil-Akaltara, at Kh. No. 647/1, 647/2, 647/6 Rakba about 5.20 Acre, District- Janjgir-Champa (C.G.).

Ref:- 1. Your letter no. vide ref. No. Nil dated : 12.08.2016.
2. Letter no. 861 dated 09.08.2016 issued by Mining Officer, Janjgir-Champa
3. No Objection Certificate issued vide Letter No. 44 Dated 12.08.2016 by Nagar Palika Parishad, Akaltara District-Janjgir-Champa (C.G.)

With reference to the above, your industry (M/s Shrinivasa Adified Pvt. Ltd., Janjgir-Champa) has applied for grant of permission for disposal of fly ash into the stone quarry situated at Village-Latia, Tehsil-Akaltara, District-Janjgir-Champa vide under reference. N.O.C. has been obtained from Nagar Palika Parishad Akaltara, District- Janjgir-Champa for back-filling of stone quarry situated at Village-Latia, Tehsil-Akaltara, having Kh. No. 647/1, 647/2, 647/6, Rakba 5.20 Acre.

Board has examined the proposal of back-filling by disposal of fly ash in the abandoned stone quarry. The Board has no objection for back-filling of stone quarry with fly ash situated at Kh. No. 647/1, 647/2, 647/6, Rakba 5.20 Acre, Village-Latia, Tehsil-Akaltara, District-Janjgir-Champa subject to fulfillment of the following terms and conditions. :-

1. Fly ash of Coal based power plant shall be transported to disposal site (stone quarry at Kh. No. 647/1, 647/2, 647/6, Village-Latia, Tehsil-Akaltara, District-Janjgir-Champa) in closed/covered vehicles in appropriate moist condition in such a way that no fugitive dust emission shall be occurred during transportation. Appropriate arrangements shall be provided to avoid fugitive dust emission during transportation of fly ash. The transportation of ash through the habitat shall be strictly avoided.

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Industry shall provide adequate arrangements such as water sprinklers/ dust suppression system etc. for control of dust emission during unloading, spreading, compaction etc. of fly ash at disposal site. Industry shall dispose off the fly ash in the disposal site with environmentally safe and scientific manner.

2. All necessary site preparation works including construction of embankment along the periphery of the stone quarry shall be carried out before starting disposal of fly ash.
3. Disposal site shall be well protected to prevent entry of unauthorized persons and stray animals. A notice board in this regard at suitable places visible to all general public shall be affixed. The disposal site shall be fenced or hedged and provided with proper gate to monitor incoming vehicles and other modes of transportation.
4. Approach and other internal roads for free movement of vehicles and other machinery shall exist at the disposal site.
5. The fly ash shall be filled in the said disposal site. Ash subjected to filling in disposal site shall be well compacted using appropriate equipments, Minimum 6 inches thick mooram/ soil layer shall be spread over the top surface after proper compaction and a vegetative cover or green belt shall be provided over the completed segment.
6. Surface run-off from disposal site, shall be prevented for any possible flow into any stream, Nalla, river, lake or pond by providing adequate arrangements.
7. Appropriate arrangement shall be made to prevent any leachate from disposal areas. The ground water and surface water quality within 500 meters of the periphery of disposal site shall be monitored to ensure that the surface water/ground water is not being contaminated and report shall be submitted to the Board.
8. Industry shall ensure ambient air quality within the disposal site shall conform to the latest prescribed.
9. The sole responsibility to protect the environment due to transportation, storage and disposal etc. of fly ash in this disposal site lies with the industry only. If there is any pollution problem in nearby areas due to transportation, storage and disposal operations/activities, the whole

activities related with disposal shall be immediately stopped and appropriate remedial measures shall be taken by the industry. The disposal site shall not be sold or sublet/leased without obtaining prior permission from the Board.

10. Industry shall follow the provisions of notification S.O. 763 (E), dated: 14.09.1999 and S.O. 979 (E), dated 27-08-2003 issued by Ministry of Environment and Forests, Government of India. Industry shall abide any decision taken by Central Government/State Government/ Central Pollution Control Board or Chhattisgarh Environment Conservation Board regarding disposal of fly ash.


REGIONAL OFFICER

Entd. No.- /R.O./T.S./ C.E./C.B./ 2016 Bilaspur, dated :

Copy to :

District Mining Officer, District-Janjgir-Champa for information please.


REGIONAL OFFICER
C.G. Env. Conservation Board
Bilaspur

कार्यालय नगरपालिका परिषद अकलतरा, जिला जांजगीर-चाम्पा छ.ग.

Ph.no. 07817-252680, Fax No. 07817-252123 (PP), E-mail ID : cmoakaltara@rediffmail.com

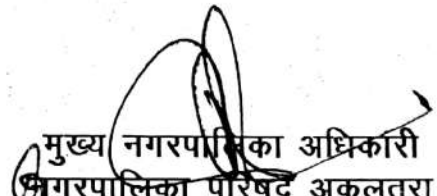
क्रमांक / 1044 / राजस्व / न.पा.प. / 2016



अकलतरा, दिनांक ... 12 / 08 ... / 2016

॥ अनापत्ति प्रमाण पत्र ॥

आवेदक श्रीनिवास एडिफाइड प्रा. लिमिटेड अकलतरा के लटिया रोड स्थित भूमि खसरा नं. 647 / 126 कुल रकबा 5.20 एकड़ भूमि पर चूना पत्थर खनन हेतु माईन्स का लीज दिनांक 19-01-2014 को समाप्त होने के कारण उक्त माईन्स को पाटने पर निकाय को कोई आपत्ति नहीं है। किसी भी प्रकार की विवाद की स्थिति में आप स्वयं जिम्मेदार होंगे।


मुख्य नगरपालिका अधिकारी
नगरपालिका परिषद अकलतरा
जिला जांजगीर-चांपा (छ.ग.)

Annexure-XXXIX

**KSK Mahanadi Power Company Limited**

CIN No. : U40300TG2009PLC064062

Works

Near Nariyara Village,
Akaltara Tehsil,
Janjgir - Champa District,
Chhattisgarh Pin : 495553
Tel (Site): 07817-284001

Registered Office

8-2-293/82/A/431/A,
Road No. 22 Jubilee Hills
Hyderabad - 500033,
Tel: +91-40-23559922-25
Tel: +91-40-23558701
Fax: +91-40235530

Ref. No: CECB, BILAS/BPSN/2500108/766**Date: 10.10.2024**

To
The Regional Officer,
Chhattisgarh Environment Conservation Board,
Vyapar Vihar, Near Pt. Deendayal Upadhyaya Park,
Bilaspur, Chhattisgarh, Pin- [495004](#)

Sub: -Submission of Fly Ash Generation & Utilization Statement for the month of **September-2024-**
Reg.

Ref: - Renewal Consent for Operation No.903 /TS/CECB/2024 Nava Raipur Atal Nagar, Dtd. 29/04/2024.

Sir,

This has reference to the captioned subject and cited references; we are enclosing herewith the **"Fly Ash Generation & Utilization Statement"** in M/s KMPCL for the month of **September -2024**.

This is submitted for your kind perusal and record please.

Thanking You,
Yours faithfully,

For **KSK Mahanadi Power company Limited**

Dr.M.V.R.N Acharyulu
(Authorized Signatory)

Encl: - Fly Ash Generation & Utilization Statement for **September-2024 (Unit-III, IV & II).**

Copy to: The Member Secretary, Paryavas Bhavan, North Block Sector-19, Atal Nagar Dist- Raipur (C.G.)-
492002

TABLE-1: FLY ASH UTILIZATION STATEMENT FOR UNIT-III FOR THE MONTH- SEPTEMBER-2024

SL. No.	Fly ash generation in the month (MT)		Fly ash utilization for the Month SEPTEMBER-2024 10 th year of operation for Unit-III (Financial Year -Apr'24 to Mar'25)										Cumulative Fly Ash generation, till the month of SEPTEMBER-2024 (MT) (Apr'24 to Mar'25)	Cumulative Fly Ash Utilization till the month of SEPTEMBER-2024 (MT) (Apr'24 to Mar'25)	% of Cumulative Fly Ash Utilization till the Month of SEPTEMBER-2024 (Apr'24 to Mar'25)	% of Fly Ash Utilisation Required as per MoEF&CC Rules
			Supply to cement plant (MT)	Supply to Ready Mix Concrete (MT)	Brick manufacturing (MT)	Land Filling (MT)	Ash dyke Raising (MT)	Agriculture (MT)	Mine Filling (MT)	Road Construction	Total (MT)	Percentage				
1	Fly ash	61057	61057	0	0	0	0	0	0	0	61057	100%	343137	343137	100%	100%
2	Bottom ash	6784	0	0	0	0	0	0	0	0	0	0%	38126	24471	64%	100%
3	Total (MT)	67841	61057	0	0	0	0	0	0	0	61057	90%	381263	367607	96%	100%

For M/s KSK- Mahanadi Power Company Limited



(Authorized Signatory)

Address: Nariyara -Village, Tehsil-Akaltara,
Dist. - Janjgir –Champa, Chhattisgarh

TABLE-2: FLY ASH UTILIZATION STATEMENT FOR UNIT-IV FOR THE MONTH- SEPTEMBER-2024

SL. No.	Fly ash generation in the month (MT)			Fly ash utilization for the Month SEPTEMBER-2024 10 th year of operation for Unit-IV (Financial Year -Apr'24 to Mar'25)									Cumulative Fly Ash generation, till the month of SEPTEMBER-2024 (MT) (Apr'24 to Mar'25)	Cumulative Fly Ash Utilization till the month of SEPTEMBER-2024 (MT) (Apr'24 to Mar'25)	% of Cumulative Fly Ash Utilization till the Month of SEPTEMBER-2024 (Apr'24 to Mar'25)	% of Fly Ash Utilisation Required as per MoEF&CC Rules
				Supply to cement plant (MT)	Supply to Ready Mix Concrete (MT)	Brick manufacturing (MT)	Land Filling (MT)	Ash dyke Raising (MT)	Agriculture (MT)	Mine Filling (MT)	Road Construction	Total (MT)	Percentage			
1	Fly ash	61646	32355	295	3027	615	0	0	60	25293	61646	100%	404888	404888	100%	100%
2	Bottom ash	6850	0	0	0	0	0	0	0	0	0	0%	44988	23566	52%	100%
3	Total (MT)	68496	32355	295	3027	615	0	0	60	25293	61646	90%	449875	428454	95%	100%

For M/s KSK- Mahanadi Power Company Limited



(Authorized Signatory)

Address: Nariyara -Village, Tehsil-Akaltara,
Dist. - Janjgir –Champa, Chhattisgarh

TABLE-3: FLY ASH UTILIZATION STATEMENT FOR UNIT-II FOR THE MONTH- SEPTEMBER-2024

SL. No.	Fly ash generation in the month (MT)		Supply to cement plant (MT)	Fly ash utilization for the Month SEPTEMBER-2024 10 th year of operation for Unit-II (Financial Year -Apr'24 to Mar'25)									Cumulative Fly Ash generation, till the month of SEPTEMBER-2024 (MT) (Apr'24 to Mar'25)	Cumulative Fly Ash Utilization till the month of SEPTEMBER-2024 (MT) (Apr'24 to Mar'25)	% of Cumulative Fly Ash Utilization till the Month of SEPTEMBER-2024 (Apr'24 to Mar'25)	% of Fly Ash Utilisation Required as per MoEF&CC Rules
				Supply to Ready Mix Concrete (MT)	Brick manufacturing (MT)	Land Filling (MT)	Ash dyke Raising (MT)	Agriculture (MT)	Mine Filling (MT)	Road Construction	Total (MT)	Percentage				
1	Fly ash	10859	0	0	0	10859	0	0	0	0	10859	100%	248326	248326	100%	100%
2	Bottom ash	1207	0	0	0	0	0	0	0	0	0	0%	27592	14803	54%	100%
3	Total (MT)	12066	0	0	0	10859	0	0	0	0	10859	90%	275917	263129	95%	100%

For M/s KSK- Mahanadi Power Company Limited



(Authorized Signatory)

Address: Nariyara -Village, Tehsil-Akaltara,
Dist. - Janjgir –Champa, Chhattisgarh

TABLE-4: Pond Ash Stock details up to SEPTEMBER-2024

SL. No.	Pond Ash Stocked (MT) as on 31.08.2024		Ash Disposal into Dyke (MT) in Sep'24	Pond Ash utilisation in Sep'24 (MT)	Pond Ash Stocked (MT) as on 30.09.2024
1	Fly ash	49,227	0	0	49,227
2	Bottom Ash	2,06,078	14,840	0	2,20,918
3	Total (MT)	2,55,305	14,840	0	2,70,145

For M/s KSK- Mahanadi Power Company Limited



(Authorized Signatory)

Address: Nariyara -Village, Tehsil-Akaltara,
Dist. - Janjgir –Champa, Chhattisgarh

Annexure-XXXX

GSTIN : 22DLBPK4444R1ZT

Subject to Janjgir jurisdiction

Mob. : 9340032947 (PRAMOD)
9329092626 (PRAVEEN)



ZORBA AGRO INDUSTRIES

Rasonta Road, **MUDPAR**, (Pamgarh), Distt. : Janjgir-Champa (C.G.)

Ref. No.

Date: 20/03/24

समापन तथा अनापत्ति प्रमाण पत्र

यह की मैं प्रमोद कुमार कुर्रे ज़ोरबा एग्रो इंडस्ट्रीज का मालिक निवासी मुड़पार तहसील- पामगढ़, जिला- जांजगीर चांपा (छ. ग.) का निवासी हूं, यह की मेरे द्वारा मेरे निजी गड्ढा भूमि खसरा नंबर 252/4, 252/5 रकबा 0.64 हेक्टेयर गड्ढा भूमि को क्षेत्रीय कार्यालय छत्तीसगढ़ पर्यावरण संरक्षण मंडल बिलासपुर पत्र क्रमांक 1277 / क्षेका/छ.ग.प.सं.मं. / 2022 दिनांक 09/09/2022 के अनुसार के.एस. के. महानदी पॉवर कंपनी लिमिटेड नरियरा जिला-जांजगीर चांपा से निकलने वाले राखड़ से पाटने हेतु लिया गया था। यह की उक्त गड्ढे को पूर्ण रूप से पाटने का कार्य हो गया है तथा नियमानुसार मिट्टी भी पूर्ण रूप से डाल कर समतलीकरण का कार्य पूर्ण हो चुका है। जिससे मैं पूर्ण रूप से संतुष्ट हूं तथा मुझे कोई भी आपत्ति नहीं है जिसका मैं अनापत्ति प्रमाण पत्र (NOC) प्रदान करता हूं।

ZORBA AGRO INDUSTRIES
PRAMOD KURRE
PROPRIETOR

प्रमोद कुमार कुर्रे

ग्राम पंचायत लटिया

श्रीमती सती बाई शांडिल्य
सरपंच

पता-ग्राम लटिया

जनपद पंचायत अकलतरा

जिला-जांजगीर चाम्पा (छ.ग.)

मो.नं.-7000867332, 7747083351

क्रमांक-.....

दिनांक-.....

समापन तथा अनापत्ति प्रमाण पत्र

यह कि ग्राम पंचायत -लटिया, तहसील- अकलतरा, जिला- जांजगीर चांपा (छ.ग.) में स्थित आरती शांडिल्य की निजी गड्ढा नुमा जमीन खसरा नंबर 364/2,365/2,365/3 रकबा 0.684 हेक्टेयर जिसके लिए क्षेत्रीय कार्यालय छत्तीसगढ़ पर्यावरण संरक्षण मंडल बिलासपुर (छ.ग.) से पत्र क्रमांक 2756/क्षेका/छ.ग.प.सं.मं. /2023 दिनांक 07/02/2023 को फ्लाई ऐश पुर्नभरण करने हेतु अनुमति दी गई थी। उक्त गड्ढा को के.एस.के. महानदी पावर कंपनी लिमिटेड से निकलने वाली राखड़ से पुर्नभरण हेतु दीपक कुमार अग्रवाल को सरपंच ग्राम पंचायत लटिया के द्वारा अनापत्ति प्रदान की गई थी जिसे दीपक कुमार अग्रवाल द्वारा पुर्नभरण का कार्य अच्छे से किया गया व नियमानुसार मिट्टी डालकर समतल कर दिया है। उक्त गड्ढा का निरीक्षण किया गया और इस कार्य से सरपंच तथा ग्राम पंचायत लटिया पूर्ण रूप से संतुष्ट है।

अतः सरपंच तथा ग्राम पंचायत लटिया के उक्त गड्ढा को राखड़/फ्लाई ऐश से पाटने / पुर्नभरण करने और मिट्टी डालकर समतल करने का कार्य पूर्ण होने से कोई भी आपत्ति नहीं है तथा ग्राम पंचायत इस कार्य का समापन पत्र व अनापत्ति प्रमाण पत्र (NOC) प्रदान करती है।

श्रीमती
सरपंच

ग्राम पंचायत लटिया
सरपंच हस्ताक्षर एवं मील



SURYA SHREE SHIKSHAN SAMITI

Regd. under Society Registration Act. 1973 (No. 44 of 1973)

HOUSE NO-A/28, BEHIND JAGGANNATH TEMPLE, GAYATRI NAGAR, RAIPUR (C.G.)

Regd. No. 9647
Dated 10/07/2006

Ref. No. S.S.S.S.

Date 22/7/2024

समापन तथा अनापत्ति प्रमाण पत्र

यह की मैं बृज भूषण द्विवेदी (अध्यक्ष सूर्या श्री शिक्षण समिति रायपुर) पिता श्री स्व. जगदीश प्रसाद द्विवेदी निवासी - वार्ड क्रमांक 09 नया बाराद्वार तहसील बाराद्वार , जिला- जांजगीर चांपा (छ.ग.) की निजी भूमि जिसका खसरा नंबर 942/1, 942/2 कुल रकबा 0.684 हेक्टेयर, ग्राम पुटपुरा, तहसील - जांजगीर, जिला- जांजगीर चांपा (छ.ग.) में स्थित है जिसके लिए क्षेत्रीय कार्यालय छत्तीसगढ़ पर्यावरण संरक्षण मंडल बिलासपुर (छ.ग) से पत्र क्रमांक 972 / क्षेका/छ.ग.प.सं.मं./ 2023 दिनांक 19/06/2023 को फ्लाई ऐश पुर्नभरण करने हेतु अनुमति दिया गया था। उक्त लो- लाईग एरिया को के.एस.के. महानदी पावर कंपनी लिमिटेड से निकलने वाली राखड़ से पाटने हेतु मेसर्स रिफ्रेक्स इंडस्ट्रीज को दिया गया था। यह की उक्त लो- लाईग एरिया को पूर्ण रूप से पाटने का कार्य हो गया है तथा नियमनुसार मिट्टी भी पूर्ण रूप से डाल कर समतलीकरण का कार्य पूर्ण हो चुका है। जिससे मैं पूर्ण रूप से संतुष्ट हूं तथा मुझे कोई भी आपत्ति नहीं है जिसका मैं अनापत्ति प्रमाण पत्र (NOC) प्रदान करता हूं।


Principal
Jagran Bani I.T.I.
Dist. Janjgir-Champa (C.G.)
बृज भूषण द्विवेदी

Date :- 24.07.2024

NO OBJECTION CERTIFICATE

M/s Aspro Project Supply Given Land Document Located at Village: Latiya, Tehsil: Akaltara, Dist Janjgir Champa and the Land details are Khasra No :- 633 and Rakba : 8.090 Hector and Permission Taken from RO CECB Bilaspur (C.G) dated 04/11/2022 Sr.no 1680/ / क्षेका/छ.ग.प.सं.मं./ 2022 to fill Land with ash .

The Above Land Ash Supply was stopped 3 years ago but due to Local Villagers are not allowing to do any further activities there. So, we have stopped all types of Activities to this Site. Also, the Dumped Ash top Layer of the Land has been Settled & Vegetation also growned up.

Therefore, We Refex Industries Ltd is Submitting NOC for this Work completion and will be fully responsible if any Complaints arises in Future.



Refex Industries Ltd.,
Regd Office: No. 10, Bascon Futura
SV IT Park, 11th floor,
Venkat Narayana Rd, T. Nagar,
Chennai-600017 Ph: 914443405950
E: info@refex.co.in | www.refex.co.in

Factory: No: 1/171, Old
Mahabalipuram Road, Thiruporur-
603110, Chengalpattu District,
Tamil Nadu. Ph: 91 44 2744 5295
CIN: L45200TN2002PLC049601



SATYAKAUSHAL FOODS

PROP :- JUGAL KISHOR LIKHMANIYA

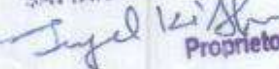
ADD:- NEAR TAROD CHOWK, KIRARI, AKALTARA

CONTACT No. - 9425229771, 9826107271

समापन तथा अनापत्ति प्रमाण पत्र

दिनांक- 27/06/2024

यह की मैं जुगल किशोर लिखमानिया पिता श्री स्व. सत्यनारायण लिखमानिया निवासी अकलतरा की निजी भूमि ग्राम किरारी, तहसील- अकलतरा में स्थित है। जिसका खसरा नंबर 5/1 कुल रकबा 3.72 एकड़, ग्राम किरारी, तहसील- अकलतरा, जिला- जांजगीर चांपा (छ.ग.) में स्थित है जिसके लिए क्षेत्रीय कार्यालय छत्तीसगढ़ पर्यावरण संरक्षण मंडल बिलासपुर (छ.ग.) से पत्र क्रमांक 1755 / क्षेत्रा/छ.ग.प.सं.मं./ 2023 दिनांक 25/07/2023 को फ्लाई ऐश पुर्नभरण करने हेतु अनुमति दिया गया था। उक्त लो- लाईग एरिया को के.एस.के. महानदी पावर कंपनी लिमिटेड से निकलने वाली राखड़ से पाटने हेतु मेसर्स रिफ्रेक्स इंडस्ट्रीज को दिया गया था। यह की उक्त लो- लाईग एरिया को पूर्ण रूप से पाटने का कार्य हो गया है। तथा नियमनुसार मिट्टी भी पूर्ण रूप से डाल कर समतलीकरण का कार्य पूर्ण हो चुका है। जिससे मैं पूर्ण रूप से संतुष्ट हूं तथा मुझे कोई भी आपत्ति नहीं है जिसका मैं अनापत्ति प्रमाण पत्र (NOC) प्रदान करता हूं।

SATYAKAUSHAL FOODS

Proprietor

आवेदक

जुगल किशोर लिखमानिया

Date :- 24.07.2024

NO OBJECTION CERTIFICATE

M/s Balmukund Verma Given Land Document Located at Village : Amora, Tehsil :Akaltara, Dist Janjgir champa and the Land details are Khasra No :-754/1 and Rakba : 0.19 Hector and Permission Taken from RO CECB Bilaspur (C.G) dated 01/05/2023 Sr.no 491/ /
क्षेका/छ.ग.प.सं.मं./ 2023 to fill Land with ash .

The Above Land is Filled With Required Ash and Covered with Soil as per the Requirement and Permitted Qty has been Supplied as per CECB Permission Letter. We Refex Industries Ltd is Submitting NOC for this Work completion and will be fully responsible if any Complaints arises in Future.



[Signature]
24/7/2024

Refex Industries Ltd.,
Regd Office: No. 10, Bascon Futura
SV IT Park, 11th floor,
Venkat Narayana Rd, T. Nagar,
Chennai-600017 Ph: 914443405950
E: info@refex.co.in | www.refex.co.in

Factory: No: 1/171, Old
Mahabalipuram Road, Thiruporur-
603110, Chengalpattu District,
Tamil Nadu. Ph: 91 44 2744 5295
CIN: L45200TN2002PLC049601



आलोक अग्रवाल

पता- R- 8 SBI कॉलोनी विनोबा नगर बिलासपुर तहसील व जिला- बिलासपुर (छ.ग.)

क्र. 005/MAY-24-25

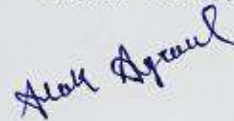
दिनांक 30/5/24.

समापन तथा अनापत्ति प्रमाण पत्र

यह की मैं आलोक अग्रवाल पिता श्री सतीश कुमार अग्रवाल निवासी आर-8 SBI कॉलोनी विनोबा नगर बिलासपुर तहसील व जिला- बिलासपुर (छ. ग.) का निवासी हूं, यह की मेरे निजी गड्ढा भूमि खसरा नंबर 226/16 रकबा 0.4540 हेक्टेयर, जो ग्राम मोहतरा तह. मस्तुरी जिला- बिलासपुर (छ. ग.) में स्थित है जिसको को क्षेत्रीय कार्यालय छत्तीसगढ़ पर्यावरण संरक्षण मंडल बिलासपुर पत्र क्रमांक 4253 /क्षेका/छ.ग.प.सं.मं./ 2023 दिनांक 20/12/2023 के अनुसार के.एस. के. महानदी पॉवर कंपनी लिमिटेड नरियरा जिला-जांजगीर चांपा से निकलने वाले राखड़ से पाटने हेतु मेसर्स प्रकाश ब्रिक्स प्रो. - प्रकाश अग्रवाल को दिया गया था। यह की उक्त लो- लाईग एरिया को पूर्ण रूप से पाटने का कार्य हो गया है तथा नियमनुसार मिट्टी भी पूर्ण रूप से डाल कर समतलीकरण का कार्य पूर्ण हो चुका है। जिससे मैं पूर्ण रूप से संतुष्ट हूं तथा मुझे कोई भी आपत्ति नहीं है जिसका मैं अनापत्ति प्रमाण पत्र (NOC) प्रदान करता हूं।

दिनांक : 30/05/24

आवेदक
आलोक अग्रवाल



Date :- 24.07.2024

NO OBJECTION CERTIFICATE

M/s Deepak Kumar Agarwal Given Land Document Located at Village : Cheudih, Tehsil :Pamgarh, Dist Janjgir champa and the Land details are Khasra No :- 112/9,113,114,256/1,112/4,112/8,1299/1Ga,1314/2,112/6,111/8112/5,112/7,111/22, 112/2 and Rakba : 5.63 Acres and Permission Taken from RO CECB Bilaspur (C.G) dated 28/04/2023 Sr.no 438/ / क्षेत्रा/छ.ग.प.सं.मं./ 2023 to fill Land with ash .

The Above Land is Filled With Required Ash and Covered with Soil as per the Requirement and Permitted Qty has been Supplied as per CECB Permission Letter. We Refex Industries Ltd is Submitting NOC for this Work completion and will be fully responsible if any Complaints arises in Future.



Refex Industries Ltd.,
Regd Office: No. 10, Bascon Futura
SV IT Park, 11th floor,
Venkat Narayana Rd, T. Nagar,
Chennai-600017 Ph: 914443405950
E: info@refex.co.in | www.refex.co.in

Factory: No: 1/171, Old
Mahabalipuram Road, Thiruporur-
603110, Chengalpattu District,
Tamil Nadu. Ph: 91 44 2744 5295
CIN: L45200TN2002PLC049601



दिनांक- 26/06/2024

समापन तथा अनापत्ति प्रमाण पत्र

यह कि ग्राम पंचायत झुलन (पकरिया) तहसील पामगढ़, जिला- जांजगीर चांपा (छ.ग.) में स्थित श्रीमती शारदा कश्यप पति उत्तरा कश्यप, श्रीमती जागृति सिंघसर्वा पति सूर्यकांत सिंघसर्वा, श्री महेशराम पिता प्रेमलाल, श्री अशोक कुमार पिता कवलराम व बलराम पिता कवलराम की निजी गड़डा भूमि जिसका खसरा नंबर 95/1, 95/3, 95/4, 95/12, 95/13, 95/14, 95/15, 95/16/ 96/1, कुल रकबा 1.405 एकड़, ग्राम झुलन (पकरिया) तहसील पामगढ़, जिला- जांजगीर चांपा (छ.ग.) में स्थित है जिसके लिए क्षेत्रीय कार्यालय छत्तीसगढ़ पर्यावरण संरक्षण मंडल बिलासपुर (छ.ग.) से पत्र क्रमांक 2143 /क्षेका/छग.प.सं. मं./ 2023 दिनांक 31/07/2023 , पत्र क्रमांक 3246 /क्षेका/छ.ग.प. सं. मं./ 2023 दिनांक 20/10/2023 को फ्लाइ ऐश पुनर्भरण करने हेतु अनुमति दिया गया था । उक्त लो- लाईग एरिया को के.एस.के. महानदी पावर कंपनी लिमिटेड से निकलने वाली राखड़ से पुनर्भरण हेतु मेसर्स बालमुकुन्द वर्मा प्रो. मीना वर्मा को सरपंच ग्राम पंचायत झुलन (पकरिया) के द्वारा अनापत्ति प्रदान किया गया था। जिसे मेसर्स बालमुकुन्द वर्मा प्रो. मीना वर्मा द्वारा पुनर्भरण का कार्य अच्छे से किया गया व नियमानुसार मिट्टी डालकर समतल कर दिया है । उक्त लो- लाईग एरिया का निरीक्षण किया गया और इस कार्य से हम पूर्ण रूप से संतुष्ट है।

अतः हमें उक्त लो- लाईग एरिया को राखड़/ फ्लाइ ऐश से पाटने / पुनर्भरण करने और मिट्टी डालकर समतल करने का कार्य पूर्ण होने से कोई भी आपत्ति नहीं है तथा हम इस कार्य का समापन पत्र व अनापत्ति प्रमाण पत्र (NOC) प्रदान करते हैं

1. श्रीमती शारदा कश्यप पति उत्तरा कश्यप
2. श्रीमती जागृति सिंघसर्वा पति सूर्यकांत सिंघसर्वा
3. श्री महेशराम पिता प्रेमलाल
4. श्री अशोक कुमार पिता कवलराम व बलराम पिता कवलराम

शारदा कश्यप
जागृति सिंघसर्वा
महेश कुमार पिता
अशोक कुमार पिता कवलराम

GSTN 22ACGPA3488Q1ZE
PAN:ACGPA3486Q

॥ SHREE GANESHAY NAMAH ॥
Subject to Janjgir Jurisdiction



9301617373
9617252222
9521278816



GIRIRAJ PADDY PROCESSORS
JHALMALA ROAD, NARIYARA, DIST: JANJGIR-CHAMPA (C.G.)

REF:

समापन तथा अनापत्ति प्रमाण पत्र

DATE 31/05/2024

यह की मैं श्यामसुंदर अग्रवाल पिता श्री स्व. हजारी लाल अग्रवाल निवासी - नरियरा, तहसील- अकलतरा, जिला- जांजगीर चांपा (छ.ग.) की निजी भूमि जिसका खसरा नंबर 1700, 1701/3, कुल रकबा 0.919 हेक्टेयर, ग्राम नरियरा, तहसील - अकलतरा, जिला- जांजगीर चांपा (छ.ग.) में स्थित है। जिसके लिए क्षेत्रीय कार्यालय छत्तीसगढ़ पर्यावरण संरक्षण मंडल बिलासपुर (छ.ग.) से पत्र क्रमांक 3244 / क्षेका/छ.ग.प.सं.मं./ 2023 दिनांक 20/10/2023 को फ्लाई ऐश पुर्नभरण करने हेतु अनुमति दिया गया था। उक्त लो- लाईग एरिया को के.एस.के. महानदी पावर कंपनी लिमिटेड से निकलने वाली राखड़ से पाटने हेतु मेसर्स रिफ्रेक्स इंडस्ट्रीज को दिया गया था। यह की उक्त लो- लाईग एरिया को पूर्ण रूप से पाटने का कार्य हो गया है। तथा नियमनुसार मिट्टी भी पूर्ण रूप से डाल कर समतलीकरण का कार्य पूर्ण हो चुका है। जिससे मैं पूर्ण रूप से संतुष्ट हूं तथा मुझे कोई भी आपत्ति नहीं है जिसका मैं अनापत्ति प्रमाण पत्र (NOC) प्रदान करता हूं।

M/S Giriraj Paddy Processor

23/10/23 23/5/24 31/5/24
Proprietor

आवेदक

श्यामसुंदर अग्रवाल

AKALTARA MINERALS

A3, ABOVE INDUSIND BANK
1ST FLOOR, VYAPAR VIHAR
BILASPUR (C. G.)
Phone : 07752-400298
Mobile : 9575302595
E-mail : akaltaraminerals@gmail.com

02/05/2024

समापन तथा अनापत्ति प्रमाण पत्र

यह की मैं आनंद खेमका पिता श्री शंभु प्रसाद खेमका निवासी एल 2 विद्या नगर बिलासपुर तहसील व जिला- बिलासपुर (छ. ग.) का निवासी हूं, यह की मेरे द्वारा मेरे निजी खदान जिसका खसरा नंबर 2111 रकबा 4 एकड़ ग्राम तरौद तहसील- अकलतरा जिला- जांजगीर चांपा में स्थित, जिसके लिए क्षेत्रीय कार्यालय छत्तीसगढ़ पर्यावरण संरक्षण मंडल बिलासपुर (छ.ग.) से पत्र क्रमांक 1075 / क्षेका / छ.ग.प.सं.मं. / 2022 दिनांक 17/08/2022, पत्र क्रमांक 1841 / क्षेका / छ.ग.प.सं.मं. / 2022 दिनांक 22/11/2022, पत्र क्रमांक 2822 / क्षेका / छ.ग.प.सं.मं. / 2022 दिनांक 13/02/2022, पत्र क्रमांक 3003 / क्षेका / छ.ग.प.सं.मं. / 2023 दिनांक 28/02/2023 के अनुसार के.एस. के. महानदी पॉवर कंपनी लिमिटेड नरियरा जिला-जांजगीर चांपा से निकलने वाले राखड़ से पाटने हेतु मेसर्स रिफ्रेक्स इंडस्ट्रीज लिमिटेड को दिया गया था। यह की उक्त खदान को पूर्ण रूप से पाटने का कार्य हो गया है तथा नियमनुसार मिट्टी भी पूर्ण रूप से डाल कर समतलीकरण का कार्य पूर्ण हो चुका है। जिससे मैं पूर्ण रूप से संतुष्ट हूं तथा मुझे कोई भी आपत्ति नहीं है जिसका मैं अनापत्ति प्रमाण पत्र (NOC) प्रदान करता हूं।



आवेदक

आनंद खेमका

Annexure-XXXXI



भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केन्द्रीय विद्युत प्राधिकरण
Central Electricity Authority
अल्ट्रा मेगा विद्युत परियोजना विकास प्रभाग
Ultra Mega Power Projects Development Division

सं.:44/FGD/ यूएमपीपी/सीईए/2019/444

दिनांक: 17-05-2019

सेवा में,

Sh. K.S.Shastry, Executive Director,
Mahanadi Power Plant/Wardha PCPL, KSK Energy Ventures Limited
8-2-293/82/A/431/A,Road No.22, Jubilee Hills, Hyderabad, 500033

Subject: Advice on suitable technology and indicative cost in installation of FGD to meet the new MOEF & CC Emission norms in 6X600 MW KSK Mahanadi Power Company Limited, Chhattisgarh.

Sir,

In reference to the new Environmental norms as per Environment (Protection) Amendment Rules 2015- Installations of FGD at KSK Mahanadi Power Company Limited, Chhattisgarh; KSK Mahanadi had submitted the revised feasibility report wherein the best suited technology and estimated indicative cost was proposed for installations of systems to control emission from the power plant.

Also, on the basis of plant specific data provided by KSK Mahanadi Power Company Limited, Chhattisgarh, as well as the present technologies available and other related conditions, a recommendation report has been prepared detailing suggestive technology and estimated indicative cost in installations of FGD (Flue Gas Desulphurization Systems) at 6X600 MW thermal Power Plant at Nariyara, Janjgir Champa District, Chhattisgarh. The cost of retrofitting of FGD for the plant needs to be discovered through open competitive bidding in consultation with representatives of major PPA stakeholder. KSK Mahanadi Power Company Limited, Chhattisgarh may invite the major PPA stakeholder to participate in bidding process till final award of FGD contract.

However, in respect of installations of FGD systems; it would be the sole responsibility of Power Plant to meet the time-limit as prescribed by appropriate Pollution Control Board. Further, KSK Mahanadi Power Company Limited, Chhattisgarh may submit the status of progress of all activities of installation starting from bidding stage till commissioning of FGD to CEA on monthly basis.

Enclosed: Recommendation report

भवदीय,

(चन्द्र शेखर)

मुख्य अभियंता

Tel. 26195472

Copy:

Secretary, CERC: for information

RECOMMENDATION OF CEA FOR FGD INSTALLATION AT KSK MAHANADI POWER COMPANY LTD INTRODUCTION

BRIEF REVIEW OF THE NEW MoEF REGULATION

The present notification from MoEF&CC amends existing norms related to emission of SPM and introduces new norms for emission of SO₂, NO_x and Mercury from Thermal Power Plants (TPPs). It also specifies modified limits for specific water consumption by TPPs and insists to convert existing once through based condenser cooling system to recirculation type. Different limits are specified based on capacity of power plant and year of installation. A summary of new regulations on air emission is given in below;

NEW REGULATIONS ON EMISSION

Date of Installation	PM	SO ₂	NO _x	Mercury (Hg)
Before 31-12 2003	100 mg/Nm ³	600 mg/Nm ³ for <500MW 200 mg/Nm ³ for ≥500MW	600 mg/Nm ³	0.03 mg/Nm ³ for ≥500MW
After 01-01-2003 & Upto 31-12-2016	50 mg/Nm ³	600 mg/Nm ³ for <500MW 200 mg/Nm ³ for ≥500MW	300 mg/Nm ³	0.03 mg/Nm ³
On or after 01-01-2017	30 mg/Nm ³	100 mg/Nm ³	100 mg/Nm ³	0.03 mg/Nm ³

SUMMARY OF NEW REGULATIONS ON WATER USE

Sl. No.	New requirement
1	All plants with Once Through Cooling (OTC) shall install Cooling Tower (CT) and achieve specific water consumption up to maximum of 3.5 m ³ /MWh within a period of two years from the date of publication of notification.
2	All existing CT-based plants reduce specific water consumption up to maximum of 3.5 m ³ /MWh within a period of two years from the date of publication of notification.
3	New plants to be installed after 1 st January 2017 shall have to meet specific water consumption up to maximum of 2.5 m ³ /MWh and achieve zero waste water discharged.

Further, to the above MoEF & CC notification, MoEF & CC has subsequently issued an Amendment dated 28th June 2018 for stack height post FGD and water Consumption which is mentioned below:

SUMMARY OF NEW DRAFT AMENDMENT

Chimney Height post FGD installation:

Sl. No.	Industry	Parameter	Standards
1	Thermal Power plants with Flue gas Desulfurization (FGD)	Chimney Height/Limit in Meters	Power Generation capacity : 100 MW and above $H = 6.902 (QX0.277)^{0.555}$ Or 100 m Whichever is more
			Less than 100 MW $H = 6.902 (QX0.277)^{0.555}$ Or 30 m Whichever is more Q = Emission rate of SO ₂ in kg/hr* H = Physical chimney height in meter * Total of all units connected with chimney. Note: These standards shall apply to coal / lignite based thermal power plants.

- All monitored values for SO₂ and NO_x shall be corrected to 6% Oxygen, on dry basis.
- Specific water consumption shall not exceed maximum of 3.0 m³/MWh for new plants installed after the 1st January 2017 and these plants shall also achieve zero waste water discharge.
- Seawater based plants are exempted from conversion of once through cooling system to Cooling Tower based system.

TARGET SO₂ EMISSION VALUE FOR KSK MAHANADI POWER COMPANY LTD

The Three units (03) of 600MW each (#2, #3 & #4 1800 MW) out of 06 units of 600 MW at KSK Mahanadi Power Company Ltd are operational and these units were commissioned on:

Unit#2 26th February 2018

Unit# 3 14th August 2013

Unit #4 26th August 2014

The rest three units (#1, #5 and #6) are under construction and will be operational by 2022. The applicable SO_x emission limit for KSK Mahanadi Power Company Ltd unit #3 & #4 is 200 mg/Nm³ and for unit #2, #1, #5 & #6 is 100 mg/Nm³. However, to take care of variation in operating input parameters such as deterioration in coal quality, higher sulphur content in coal, higher flue gas temperature and flow, higher plant heat rate etc. sufficient design margin needs to be considered on actual performance parameters.

APPLICABLE NORMS FOR KSK MAHANADI POWER COMPANY LTD

Year of commissioning	Unit no	SPM	SO ₂	Nox	Mercury
2003-2016	3 & 4	50mg/Nm ³	200 mg/Nm ³	300mg/Nm ³	0.03mg/Nm ³
On or after 01-01-2017	#2 & other three units	30 mg/Nm ³	100 mg/Nm ³	100 mg/Nm ³	0.03 mg/Nm ³

Salient Features of Power Plant:

1. Plant Capacity: 6x600 MW=3600 MW with Sub-critical technology.
2. No of Units operational: 03 (1800 MW)
3. No of units under construction:03 (1800MW)
4. Average Availability (2017-18) :76.49 %
5. Average PLF(2017-18):54.63 %
6. Major PPA: 55% UPPCL
7. Average actual GCV (2017-18): 4006 Kcal/kg.
8. Sulphur in Coal in different years of operation is 0.31% to 0.69%.

TECHNOLOGY

In feasibility report KSK Mahanadi Power Company Ltd has opted for "Wet Lime Stone" based FGD technology. Wet Lime stone Base So₂ removal technology is technically feasible for KSK Mahanadi Power Company Ltd. While considering Wet lime stone based FGD, the reagent source may be selected based on availability of limestone, limestone purity, cost and quality.

ENGINEERING ASPECTS

1. **Absorber**-Individual absorber for each Unit.
2. Limit SO₂ below environment norms with up to 0.6% Sulfur content in Coal.
3. **Absorber Lining** – Such as Ceramic Tiles/clad sheet of C-276/Alloy 59 /Steel Alloy/Glass flake filled multi-functional epoxy /glass flake lining etc.
4. **Other lining** - All ducts, effluent handling pits or concrete zone etc. to be protected with glass flake based coating/ Steel Alloy Lining etc. Piping may be of flake glass based coating/carbon steel rubber lined (CSRL)/rubber lining however lesser diameter pipes can be of GRP(Glass Reinforced Plastic)/FRP (Fiber Glass reinforced Plastic)/ Alloy Steel material etc.
5. **Monitoring System**- Measurement of SO₂ in the outlet and inlet are important for the calculation of the FGD efficiency and control the amount of reagent. The important parameters for deciding monitoring system are response time (shorter the better), less inventory (common for inlet and outlet), less maintenance (high maintenance interval). In view of this proven advance technology may accordingly be selected considering the plant specific requirements.
6. **Auxiliary Power Consumption**- The maximum Additional Auxiliary power Consumption for complete FGD facilities will be maximum 1.0% for Limestone based FGD.

If the existing chimney is used, the requirement of GGH may be seen. The additional Auxiliary Power Consumption with GGH (only if using old chimney) will be maximum 0.3%.

INDICATIVE COST ESTIMATION

An indicative Base cost estimation is done by CEA in order to facilitate KSK Mahanadi Power Company Ltd determine the price for installation of FGD on the major heads of CAPEX .

CAPEX

Rs. 0.37 Cr/MW (BASE COST) for lime stone base FGD. This indicative cost is the "Base Cost" only and does not include Opportunity cost (associated with generation loss due to interconnection of chimneys with absorber) and Taxes-Duties. This Indicative "Base cost is calculated considering new chimney without GGH.

The cost of retrofitting FGD for KSK Mahanadi Power Company Ltd should be discovered through open competitive bidding in consultation with lead procurer. The lead procurer (to be invited by KSK Mahanadi Power Company Ltd) may participate in bidding process till final award of FGD contract.

OPEX

Operating Cost (OPEX) will include Reagent cost, Additional water consumption associated with FGD, Manpower cost, Auxiliary Power Consumption, By-product handling and revenue earned through disposal of by product. The OPEX should be kept as low as possible by reducing Auxiliary Power Consumption and producing good quality of saleable by-product.

OPPORTUNITY COST

Since interconnection of chimneys with absorber may result in loss of generation of the plant, hence KSK Mahanadi Power Company Ltd is advised to minimize this interconnection time by taking suitable measure so that the "Opportunity cost" associated with interconnection may have least impact on tariff revision.

CHIMNEY & LINING

In feasibility report KSK Mahanadi Power Company Ltd has opted for using new wet chimney.

Option I (As opted by KSK Mahanadi Power Company Ltd)

Separate new wet chimney over ground for each absorber.

The other chimney options for KSK Mahanadi Power Company Ltd are as follows:

Option II

New permanent wet chimney above each Absorber.

Option III

New single wet chimney with three flue cans (for three units) or three wet chimney with twin flue cans for all six units.

Option IV

Using Existing chimney by converting it to Wet Chimney by applying appropriate corrosion protection lining. To avoid excess loss of generation a temporary chimney may be provided above each absorber or on ground.

Final selection of chimney may only be made after conducting a lifecycle cost benefit analysis and seeing technical feasibility of available options before opting for either of above option.

Corrosion Protection Lining for Chimney:

Currently there are various lining material are available in the industry which can resist the sulfur based acids and which can be used for corrosion protection as mentioned below.

- i. Borosilicate Block lining
- ii. Steel Alloy lining
- iii. Glass flake filled epoxy phenol novolac.
- iv. Glass flake lining etc.

KSK Mahanadi Power Company Ltd is advised to study “the cases of failure” of all lining material used for corrosion protection for various sections of FGD system. The life cycle cost analysis for selection of these materials may be done considering these failure studies for optimum selection.
