STATUS OF COMPLIANCE TO THE CONDITIONS STIPULATED IN ENV. CLEARANCE FOR BAUXITE PRODUCTION @ 6.825 MTPY WITH RESPECT TO PANCHPATMALI CENTRAL & NORTH BLOCK BAUXITE MINE,NALCO

(Ministry Letter No. J-11015/49/2008-IA. II(M) Dt. 20-02-2009)

Sl.No.	A. SPECIAL CONDITIONS	Status of Compliance as on 31.3.2023
i	The environmental clearance is in continuation to the environmental clearance earlier accorded to this project by the Ministry vide letter No. J-11015/09/2000-IA.II (M) dated 30.07.2004. The lease area shall remain unchanged.	The lease area remains unchanged. At present the lease area of Central and North Block = 1315.264 hectares.
ii	The project proponent shall obtain Consent to Establish from the State Pollution Control Board and effectively implement all the conditions stipulated therein.	The consent to establish for 6.825 MTPY production capacity for Central-North Block was obtained from SPCB, Odisha vide letter no. 16213/Ind-II-NOC-5666, DTD. 4-9-2013.
iii	The environmental clearance is subject to grant of forestry clearance. The project proponent shall obtain requisite prior forestry clearance under the Forest (Conservation) Act,1980 for working in the forest area	Forest Clearance exists vide MoEF&CC letter No- F.No.8-40/1993-FC(PT-I) Dt.15th September 2014 for the entire forest land of 1294.283 ha of forest land.
iv	The mining operations shall be confined to the hill tops only and restricted to above ground water table and it should not intersect the groundwater table. In case of working below the ground water table, prior approval of the Ministry of Environment and Forests and the Central Ground Water Authority shall be obtained, for which a detailed hydro-geological study shall be carried out	It is revealed from a study by RAMKY (in Yr 2010) that the ground water table exists below 80 mtr. from the plateau top, where the mining activities are going on. As the Mining activities limited to 35 Mtrs only from the surface, there is no impact of Mining operation on the ground water / aquifers.
v	The project proponent shall ensure that no natural watercourse and / or water resources are obstructed due to any mining operations. Adequate measures shall be taken while diverting seasonal channels emanating from the mine lease, during the course of mining operation.	No Natural water course exists on hilltop/ plateau top. As such, mining operation which is confined to hill top does no way obstruct natural water course. No rain water from the mining area is allowed to flow down below the valley by constructing peripheral barriers.
vi	The top soil shall temporarily be stored at earmarked site(s) only and it should not be kept unutilized for long. The topsoil shall be used for land reclamation and plantation.	Top soil is being separately removed and is concurrently used in backfilling of mined out area. The top soil generated and utilized in reclamation for the last five years are as follows.

Year	Top soil generated (MT)	Top soil utilized (MT)	Top soil stored (MT)
2017-18	57,040	57,040	Nil
2018-19	1,04,070	1,04,070	Nil
2019-20	1,22,410	1,22,410	Nil
2020-21	1,07,560	1,07,560	Nil
2021-22	115000	115000	Nil
2022-23	133490	133490	Nil

<table>
<tr><td>vii</td><td>The overburden (OB) generated shall be concurrently backfilled. There shall be no external over burden dump. The entire backfilled area shall be progressively afforested. Monitoring and management of rehabilitated areas should continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment and Forest and its Regional Office located at Bhubaneswar on six monthly basis.</td><td>OB generated is being concurrently backfilled. Reclamation programme for the mined out area goes on concurrent to mining operation.

The OB generated (including top soil) and utilized in reclamation for the last five years are as follows.

<table><tr><th>Year</th><th>OB generated (MT)</th><th>OB utilized (MT)</th><th>OB stored (MT)</th></tr><tr><td>2017-18</td><td>7,20,000</td><td>7,20,000</td><td>Nil</td></tr><tr><td>2018-19</td><td>8,19,300</td><td>8,19,300</td><td>Nil</td></tr><tr><td>2019-20</td><td>6,84,690</td><td>6,84,690</td><td>Nil</td></tr><tr><td>2020-21</td><td>7,64,205</td><td>7,64,205</td><td>Nil</td></tr><tr><td>2021-22</td><td>798225</td><td>798225</td><td>Nil</td></tr><tr><td>2022-23</td><td>788300</td><td>788300</td><td>Nil</td></tr></table>
The plantation in the rehabilitated area is maintained till the vegetation becomes self sustaining. Compliance status is submitted to MOEF every six months.</td></tr>
<tr><td>viii</td><td>Catch drains and siltation ponds of appropriate size shall be constructed around the mine working, soil and mineral dumps to prevent run off of water and flow of sediments directly into the water bodies. The water so collected shall be utilized for watering the mine area, roads, green belt development etc. the drains shall be regularly desilted, particularly after the monsoon, and maintained properly.Garland drains, settling tanks and check dams of appropriate size, gradient and length shall be constructed around the mine pit, topsoil dumps and the mineral dumps to prevent run off of water and flow of sediments directly into the water bodies and sump capacity shall be designed keeping 50 % safety margin over and above peak sudden rainfall (based on 50 years data) and maximum discharge in the area adjoining the mine site. Sump capacity shall also provide adequate retention period to allow proper settling of silt material. Sedimentation pits shall be constructed at the corners of the garland drains and desilted at regular intervals</td><td>Siltation ponds of adequate size are provided to collect sediments from the mineral stock pile area near crusher house during rain through drains. Rain water accumulated in the sedimentation ponds cannot go out due to peripheral barrier and percolates down through porous mined out surface. The mine is a elongated strip of land with peripheral barriers on the western and eastern sides which prevent any rain water from going outside. Inside the mine sedimentation pits of adequate size have been kept which collect water through drains with natural gradient. Due to porous nature of the mined out surface, the rain water percolates down to recharge the ground water. There are no waste dumps or OB dumps as concurrent reclamation method has been adopted. The sedimentation pits are cleaned periodically to maintain the sump capacity to hold water. There are no active dumps and hence there is no question of washouts from dumps.</td></tr>
<tr><td>ix</td><td>Dimension of the retaining wall at the OB benches within the mine to check run-off and siltation should be based on the rainfall data.</td><td>The overburden material is concurrently reused in backfilling of mined out area. The runoff generated inside mining area cannot go out as there are in-situ peripheral barrier all around the mining area. All the runoff are diverted to the sedimentation tanks inside the mining area where the collected water percolates into the ground.</td></tr>
<tr><td>x</td><td>The project proponent shall develop a 7.5 m wide green belt in the safety zone all around the mining lease. In addition, plantation shall be raised in the backfilled and the reclaimed area, around void roads etc. by planting the native species in consultation with the local DFO / Agriculture Department. The density of the trees should be around 2500 plants per ha.</td><td>A green belt having minimum width of 7.5 mtr has been developed all around the Mined out area in the safety zone. This green belt is developed/ maintained 500M ahead of Mining operation. Native species like Jamun,Rose Apple, Guava, Mangos, Jackfruit ,Tamarind , Karanj, etc are being planted at the rate of 2500 plants /ha for development of the green belt. In addition to that plantation has also been carried out in the backfilled/reclaimed area.</td></tr>
</table>

		As on 31.3.2023 the plantation carried out in different areas in Central and North Block are as follows. (i) Mining area including peripheral barrier :15,57,327 (ii) Conveyor corridor: 89,300 (iii)Auxiliary facilities: 72,800 (iv) Water supply and powerline: 5,000 (v)Around explosive magazine: 1,70,000 (vi)Unused area: 68,956. (vi)Outside lease area: 13,95,354. Total trees planted in Central and North Block **as on 31.3.2023** is 33, 58,737.
xi	Regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of SPM and RSPM such as around crushing and screening plant, loading and unloading point and all transfer point. Extensive water sprinkling shall be carried out on haul roads. It shall be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.	Regular water sprinkling is being done using 06 nos of self propelled mobile water tankers. Provision of PLC controlled Auto sprinkling system installed over Permanent haul roads (4.5 km). The AAQ quality monitoring is done every month. The monitoring locations are A1(Baiguda village) , A2(Bitiarguda Village), A3(Goudguda village), A4(Kakriguma village), A5(Upper Meeting village), A6(Near Main Haul Road Area), A7(Near Crusher HouseA8(Roof of the HEMM main building), A9(Roof of Panchpatmali Bhavan), A10(Near SMCP North Block). The latest results of ambient air analysis are given at **Annexure-I.**
xii	Regular monitoring of the flow rate of the springs and perennial nallahs flowing in and around the mine lease shall be carried out and records maintained.	NALCO has been measuring water flow rate of perennial streams at the foot hill in 17 locations on four specific periods during the month of Jan, April, Aug and Nov every year. For 2022-23, the stream flow has been measured at 17 locations during April 2022, August 2022, November 2022 and January 2023. The locations are 1.Litiguda,2.Jholaguda,3.Bhitara Bhejaput, 4.Barigurha,5.Kapsiput,6.Litaputta, 7.Murdagurha, 8.Gaurhaguda, 9.Tenguligurha, 10.Kakirguma, 11.Tentulipadar, 12.Keler, 13.Kusumagurha, 14.Kirajhola, 15.Rangapani, 16.Pansaputa and 17.Balipeta. For 21-22, the results are given at **Annexure-II.**
xiii	The project authority shall implement suitable conservation measures to augment ground water resources in the area in consultation with the Regional Director, Central Ground Water Board.	The plateau top, where the mining operation is confined, stands out about 300 mtr above the surrounding valley areas. The ground water exists at a depth of about 80mtr. At present, 3 no. of rain water harvesting reservoirs have been developed atop the mines. The capacity of the three nos of ponds are as follows. **Sl No. / Description / Capacity of storage in cum.** 1 / Pond no-1 / 19800 2 / Pond no-2 / 23625 3 / Pond no-3 / 10000 Also, rooftop rainwater harvesting structures for the Administration Building , Mine Manager's Building and MVT centre has been completed by 2014 to augment ground water recharging. Further, the method of Mining & the peripheral barrier all around does not allow the storm water from within the mining area to go outside valley areas. The water thus trapped, percolates down & recharges the ground water. Further as per advice of CGWB, Bhubaneswar , a suitable agency (M/s Geoenvitech Research & Services Pvt Ltd , Bhubaneswar) was appointed for carrying out a hydro-geological study for suggesting measures for rain water harvesting and augmentation of ground water resources. The recommendations are implemented.

<table>
<tr><td>xiv</td><td>Regular monitoring of ground water level and quality shall be carried out in and around the mine lease by establishing a network of existing wells and constructing new piezometers during the mining operation. The monitoring shall be carried out four times in a year, pre-monsoon (April-May) , monsoon (August), Post-monsoon (November) and winter (January) and the data thus collected may be sent regularly to the Ministry of Environment and Forest and its Regional Office, Bhubaneswar, the Central Ground Water Authority and the Regional Director, Central Ground Water Board. If at any stage, it is observed that the ground water table is getting depleted due to the mining activity, necessary corrective measures shall be carried out.</td><td>The ground water level was monitored by M/s RAMKY (in Yr 2010) by construction of borewells. It was found that the ground water table exists at a great depth i.e. below 80 mtr. from the plateau top.

The ground water quality monitoring is done during April, August, November and January every year. The monitoring locations are (15 nos) Metingi Village,Chhatamba Village, Jharhiapadar Village, Tentulipadar Village, Ichhapur Village, Mundagarhati Village, Bijaghati Village, Putraghati Village, Putraghati Village, Chararha Village, Kapsiput Village, Jambagurha Village, Shriguda Village, Kakiriguma Village,and Sorisha padar Village. The parameters being monitored are as per IS 10500:2012 specified for drinking water. For 22-23, the results are given at annexure-III.

One no of piezeometer has been constructed for monitoring of ground water level.</td></tr>
<tr><td>xv</td><td>Appropriate mitigative measures shall be taken to prevent pollution of the Indravati River, the Vagabvalli river, Banadehar River and Kerandi River in consultation with the State Pollution Control Board.</td><td>Appropriate mitigative measures have been taken to prevent pollution of rivers in consultation with SPCB, Odisha. They have specified conditions in CTO to treat the waste water streams and not to discharge runoff from mining area into water bodies.

The actions taken- (1) There is no mine drainage water generated at Mines (2) rain water (with sediment) is also not allowed to go out of Mining areas because of the insitu- peripheral barrier existing all around the mining pit. 21 check dams have been constructed to retain the washouts if any from the mining area going downhill and contaminating water bodies. (3) The rain water around stockpiles are diverted to sedimentation basins where solid particle settle down and water percolates into the ground. (4)Effluent from toilets are treated in septic tanks. (5) The mine being a zero discharge mine, has got adequate facility to treat wash water from Workshop & Canteen & the treated water is completely reused for dust suppression and plantation purpose and no waste water is discharged outside. As already explained, Further the perennial streams emanating from the Panchpatmali hill slopes are being monitored regularly and all parameters are within prescribed norms. As such in no way the mining operation affects the river basins which are any way situated at least 30 KM away..</td></tr>
<tr><td>xvi</td><td>The project proponent shall obtain necessary prior permission of the competent authorities for drawl of requisite quantity of water (surface water and ground water) required for the project</td><td>Permission for drawal of surface water from Jholaguda streams upto 0.5MGD is available vide letter No. 15986, dtd.13-6-2018.</td></tr>
<tr><td>xvii</td><td>Suitable rainwater harvesting measures on long term basis shall be planned and implemented in consultation with the Regional Director, Central Ground Water Board</td><td>At present, 3 no. of rain water harvesting reservoirs have been developed atop the mines. The capacity of the three nos of ponds are as follows.

<table>
<tr><th>Sl No.</th><th>Decription</th><th>Capacity of storage in cum.</th></tr>
<tr><td>1</td><td>Pond no-1</td><td>19800</td></tr>
<tr><td>2</td><td>Pond no-2</td><td>23625</td></tr>
<tr><td>3</td><td>Pond no-3</td><td>10000</td></tr>
</table>

Also, rooftop rainwater harvesting structures for the Administration Building ,Mine Manager's Building and MVT centre has been completed by 2014 to augment ground water recharging.</td></tr>
</table>

		Further, the method of Mining & the peripheral barrier all around does not allow the storm water from within the mining area to go outside valley areas. The water thus trapped, percolates down & recharges the ground water. Further as per advice of CGWB, Bhubaneswar , a suitable agency (M/s Geoenvitech Research & Services Pvt Ltd , Bhubaneswar) was appointed for carrying out a hydro-geological study for suggesting measures for rain water harvesting and augmentation of ground water resources. The recommendations are implemented.
xviii	Vehicular emissions shall be kept under control and regularly monitored. Measures shall be taken for maintenance of vehicles used in mining operations and in transportation of mineral within the lease up to the stockyard. The mineral transportation within the mine lease shall be carried out through the covered trucks only and the vehicles carrying the mineral shall not be overloaded	Monitoring of exhaust emission of all the vehicles operating at mine is conducted once in six months through an outside agency authorized by SPCB, Odisha. Bauxite ore is transported in the mine area in an environmentally safe manner by limiting the speed limit of transporting equipment and also by maintaining proper road conditions.
xix	No blasting shall be carried out after the sunset. Blasting operation shall be carried out only during the daytime. Controlled blasting shall be practiced. The mitigative measures for control of ground vibrations and to arrest fly rocks and boulders should be implemented.	Blasting has been stopped since April 2022. Whenever it will be done in future , it will be done during shift change over between 1.15PM to 2PM .No blasting will be done beyond day light hours .Further, controlled blasting will be practiced with use of NONELs for sequential blasting to reduce fly rocks, boulders & ground vibration.
xx	Drills shall either be operated with dust extractors or equipped with water injection system	All drills are operated with vacuum dust extraction system with provision of water injection for dust suppression.
xxi	Mineral handling area shall be provided with adequate number of high efficiency dust extraction system. Loading and unloading areas including all the transfer points should also have efficient dust control arrangements. These should be properly maintained and operated.	All transfer points in crushing & Conveying system are provided with efficient dry fog system to suppress dust at source.
xii	Consent to operate shall be obtained from the State Pollination Control Board, Orissa prior to start of enhanced production from the mine.	At present Mine is operating with consent to operate for 6.825 MTPA production capacity vide order No. 4162/Ind-I-Con-92, Dtd. 17-3-2022/CONSENT ORDER NO.58, which is valid upto 31.3.2024.
xxiii	Sewage treatment plant shall be installed for the colony. ETP shall also be provided for the workshop and wastewater generated during the mining operation	The Mine & Refinery combined township exists 20KM away at Damanjodi where sewerage treatment plant is provided whereas The mine is operating a zero discharge system for effluents where all the waste water is treated,analysed and reused for sprinkling on the haul road for dust suppression and plantation. Effluents from the Mechanical Workshop area is being channelized through well-designed oil-water separation tank where oil is collected and the clear water is collected in zero discharge sump. There is a canteen waste water disposal system (biological treatment unit) designed, constructed and maintained to treat the canteen waste water. All the treated waste water from canteen and HEMM workshop is used for horticulture & dust suppression.
xxiv	Pre-placement medical examination and periodical medical examination of the workers engaged in the project shall be carried out and records maintained. For the purpose, schedule of health examination of the workers	All employees and contract workers are provided with protective devices. For all employees of NALCO, periodical medical examinations are done & records thereof maintained. During April 2022-March 2023 , 463 nos of employees have undergone periodical medical testing. No occupational diseases have been detected so far.

	should be drawn and following accordingly.	
xxv	Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. the housing may be in the form of temporary structures to be removed after the completion of the project.	No labour camp exists on plateau top. All construction laborers /workers come from Damanjodi & surrounding villages at the foothill of Panchpatmali hill.
xxvi	The project proponent shall take all precautionary measure during mining operation for conservation and protection of endangered flora and fauna found in the study area. Action plan for conservation of flora and fauna shall be prepared and implemented in consultation with the State Forest and Wildlife Department. Necessary allocation of funds for implementation of the conservation plan shall be made and the fund so allocated shall be included in the project cost. All the safeguard measures brought out in the Wildlife Conservation Pan so prepared specific to the project site shall be effectively implemented. A copy of action plan shall be submitted to the Ministry of Environment and Forest and its Regional Office, Bhubaneswar.	A Site Specific Wildlife Management plan as prepared by NALCO has been approved by PCCF(Wildlife), Odisha, Bhubaneswar vide Memo No. 4011/1 WL(C) SSP-397/2013 Dt. 19th May 2014, On the basis of the above stated approval, DFO, Koraput had raised a demand note No.1838 Dt. 26-05-2014 for payment of Rs. 2011.50 lakhs. With reference to the above stated demand note, NALCO has made a payment of Rs. 2011.50 lakhs in Orissa CAMPA account in Corporation Bank, Lodhi Road, New Delhi through RTGS on Dt.04-06-2014. Besides the above, a total amount of Rs 7, 62, 85,312/- have been deposited in different phases as per demand letters of DFO,Koraput in Orissa CAMPA by NALCO towards Regional Wildlife Management Fund for implementation by State Forest Department. The conservation measures suggested are under process of implementation. The copy of action plan has been submitted to MoEF&CC vide letter No- NAL/MIN/GM(Mines)2017/677, Dtd. on 12-10-2017. The status of implementation of conservation measures are given in **Annexure-IV.**
xxvii	Digital processing of the entire lease area using remote sensing technique shall be carried out regularly once in three years for monitoring land use pattern and report submitted to Ministry of Environment and Forests and its Regional Office, Bhubaneswar	A digital land-use map (shape file) as on 31.3.2021 has been submitted to MoEF&CC, Bhubaneswar on 1st July 2021 vide mail.
xxviii	A Final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure of approval.	Final mine closure plan shall be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure.
	GENERAL CONDITIONS	
i	No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forests	The user agency (NALCO) undertakes that there shall be no change in technology and scope of work without prior approval from MoEF.
ii	No change in the calendar plan including excavation, quantum of mineral bauxite and waste should be made	The user agency (NALCO) undertakes that there shall be no change in calendar plan including excavation, quantum of Bauxite, Waste/OB generation of work without prior approval from competent authority.
iii	At least four ambient air quality-monitoring stations should be established in the core zone as well as in the buffer zone for RSPM, SPM, SO2 & NOx monitoring. Location of the stations should be decided based on the meteorological data, topographical features and environmentally and ecological sensitive targets and frequency of monitoring should be.	At present 10 air quality monitoring stations are established in and around Mines based on the mentioned factors and measurements are being done once in every month for parameters as per the latest MOEF notification of September 2009. The location of monitoring stations has been fixed in consultation with SPCB, Odisha.

	undertaken in consultation with the State Pollution Control Board.	
iv	Data on ambient air quality (RSPM, SPM, and SO2 & NOx) should be regularly submitted to the Ministry of Environment and Forests including its Regional office located at Bhubaneswar and the State Pollution Control Board / Central Pollution Control Board once in six month.	Data on air quality is being collected once in every month. Records submitted to statutory authorities once in six months. The AAQ quality monitoring is done every month. The monitoring locations are A1(Baiguda village) , A2(Bitiarguda Village), A3(Goudguda village), A4(Kakriguma village), A5(Upper Meeting village), A6(Near Main Haul Road Area), A7(Near Crusher HouseA8(Roof of the HEMM main building), A9(Roof of Panchpatmali Bhavan), A10(Near SMCP North Block). The latest results of ambient air analysis are given at **Annexure-I.**
v	Fugitive dust emissions from all the sources should be controlled regularly. Water spraying arrangement on haul roads, loading and unloading and at transfer points should be provided and properly maintained.	Water spraying on haul road is carried out both with fixed (4.5 km long) and mobile sprinklers (6 nos) . Loading points of crusher house is provided with dry fog system. One no of fog cannon has also been deployed in the stock pile area to suppress dust. Transportation of Bauxite ore is carried out through a cable belt conveyor of 14.6KM long, provided with hood all along.
vi	Measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operations of HEMM, etc. should be provided with ear plugs / muffs	Noise monitoring in work zone is taken up once in every quarter. Equipment selection is done keeping noise reduction features in view. Workers are provided with ear plugs /muffs. Besides ambient noise level is being monitored at 10 locations in and around the mine. Noise level monitoring for the period Apr22 to March 2023 is available at **annexure-V.**
vii	Industrial waste water (workshop and waste water from the mine) should be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May, 1993 and 31st December 1993 or as amended from time to time. Oil and grease trap should be installed before discharge of workshop effluents.	The mine is operating a zero discharge system for effluents where all the waste water is treated, analysed and reused for sprinkling on the haul road for dust suppression and plantation. Effluents from the Mechanical Workshop area is being channelized through well-designed oil-water separation tank where oil is collected and the clear water is collected in zero discharge sump. There is a canteen waste water disposal system (biological treatment unit) designed, constructed and maintained to treat the canteen waste water. All the treated waste water from canteen and HEMM workshop is used for horticulture & dust suppression. The treated waste water from canteen and HEMM workshop area are analysed before being reused. The parameters are analysed every month.The analysis results for Apr22-March 2023 are available at **Annexure-VI**. The above treated water is completely reused without discharging outside.
viii	Personnel working in dusty areas should wear protective respiratory devices and they should also be provided with adequate training and information on safety and health aspects Occupational health surveillance programme of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed	All employees and contract workers are provided with protective devices. Regular training programmes are held in MVT center on health and safety aspects for contract workers as well as employees. For all employees of NALCO, periodical medical examinations are done & records thereof maintained. During April 2022-March 2023 , 463 nos of employees have undergone periodical medical testing. No occupational diseases have been detected so far.
ix	A separate environmental management cell with suitable qualified personnel should be set-up under the control of a Senior Executive, who will report	A Separate Environmental Management Cell, being headed by GM(Env) who is reporting directly to GGM (Mines), exists for management of environment.

<table>
<tr><td></td><td>directly to the Head of the Organization.</td><td></td></tr>
<tr><td>x</td><td>The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year wise expenditure should be reported to the Ministry of Environment and Forests and its Regional Office located at Bhubaneswar</td><td>Being a public sector, the system does not allow for creating a separate account for environmental protection measures. However adequate fund is provided under the budget of executing departments for installation and maintaining various pollution control measures. The fund earmarked for environmental protection measures is never diverted for any other purpose. Adequate fund is always allocated to meet the capital & recurring expenses to implement the environmental control measures inclusive of plantation. Many expenditures for Central and North Block and South Block on environment are carried out through common contracts. Hence the total expenditure will be reported jointly. The capital expenditure till date and the recurring expenditure for protection of environment at Panchpatmali Bauxite Mine for the last three years are as follows

a. Capital Cost for Environmental Pollution control incurred during 2022-23 - Rs. 400.00 Lakh
b. Recurring cost
<table>
<tr><th>S. No</th><th>Activity</th><th>2020-21 (Rs)*</th><th>2021-22 (Rs)*</th><th>2022-23 (Rs)**</th></tr>
<tr><td>1.</td><td>Backfilling and land reclamation*</td><td>4,74,00,990</td><td>7,44,68,438</td><td>76,667,560.04</td></tr>
<tr><td>2.</td><td>Environmental Pollution Control</td><td>22,78,520</td><td>40,41,193</td><td>60,26,649.00</td></tr>
<tr><td>3.</td><td>Plantation and Horticulture</td><td>67,36,291</td><td>94,23,930</td><td>84,73,229.00</td></tr>
<tr><td>4</td><td>Operation and maintenance of Water Sprinkling system & zero discharge system</td><td>12,00,000</td><td>15,48,846</td><td>9,95,482.00</td></tr>
<tr><td></td><td>Total</td><td>5,76,15,801.00</td><td>8,94,82,407.00</td><td>9,21,62,920.07</td></tr>
</table>
Note- Backfilling and land reclamation cost is calculated based on the proportionate cost for diesel incurred in handling of overburden material as compared to the total excavation.
* The values contain combined expenditure for South Block and Central and North Block.
* * The values contain expenditure for Central and North Block only.</td></tr>
<tr><td>xi</td><td>The project authorities should inform to the Regional Office located at Bhubaneswar regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work</td><td>The MoEF Regional Office shall be kept informed as required.</td></tr>
<tr><td>xii</td><td>The Regional Office of this Ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The project authorities should extnd full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information / monitoring reports</td><td>NALCO undertakes that all co-operations will be extended to the officers of the Regional Office of the Ministry located at Bhubaneswar by furnishing requisite data, information/ monitoring reports.</td></tr>
<tr><td>xiii</td><td>The project proponent shall submit six monthly report on the status of the implementation of the stipulated</td><td>Six monthly report on the status of the implementation of the stipulated environmental safeguards is being submitted to MoEF, Govt. of India and State Pollution Control Board regularly.</td></tr>
</table>

	environmental safeguards to the Ministry of Environment and Forests, its Regional Office Bhubaneswar, Central Pollution Control Board and State Pollution Control Board. The proponent shall upload the status of compliance of the environmental clearance conditions on their website and update the same periodically.	
xiv	A copy of clearance letter shall be marked to concerned Panchyat /local NGO, if any, from whom suggestion / representation has been received while processing the proposal	No such suggestions / representation has been received from the Panchayat / local NGO, while processing the clearance proposal.
xv	The State Pollution Control Board should display a copy of the clearance letter at the Regional office, District Industry Centre and the Collector's office / Tahsildar's Office for 30 days	The clearance letter has been displayed at the required places.
xvi	The project authorities should advertise at least in two local newspapers widely circulated, one of which shall be in the vernacular language of the locality concerned, within 7 days of the issue of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and also at web site of the Ministry of Environment and Forest at http://envfor.nic.in and a copy of the same should be forwarded to the Regional Office of the Ministry located at Bhubaneswar.	The accordance of Environmental clearance has been advertised in two local news papers.

22/06/23

(Rasheed Waris)
Group General Manager(Mines)

ANNEXURE-I

AMBIENT AIR QUALITY ANALYSIS AT PANCHPATMALI CENTRAL & NORTH BLOCK BAUXITE MINE NALCO (2022-23)

Monitoring station	Parameter	Norm	Apr'22	May'22	Jun'22	Jul'22	Aug'22	Sep'22	Oct'22	Nov'22	Dec'22	Jan'23	Feb'23	Mar'23	Avg
A1 (Baiguda village)	RPM (µg / m3)														
	PM 2.5(60µg / m3)	60	32.5	30.5	22.5	20.4	14.64	18.7	20.45	23.68	26.76	29.56	29.46	26.43	24.62
	PM10(100µg / m3)	100	56.9	56.9	38.5	35.9	27.47	38.3	39.68	47.52	50.15	52.76	51.28	49.71	45.43
	NRPM (µg /m3)		59.8	59.8	40.8	38.6	30.35	41.5	42.64	51.62	56.81	57.47	54.71	53.29	48.95
	SPM(µg /m3)		117	117	79.4	74.5	57.82	79.8	82.32	99.14	106.96	110.23	105.99	103	94.38
	SO_2 (80 µg /m3)	80	8.09	7.28	6.14	6.58	4.36	5.18	7.08	7.41	8.16	7.01	8.19	8.19	6.97
	NO_X (80µg /m3)	80	16.5	13.4	14.5	16.6	10.97	11.9	14.36	12.19	14.56	12.46	13.54	15.61	13.88
	CO (2 mg /m3)	2	0.56	0.43	0.31	0.41	0.22	0.3	0.42	0.41	0.41	0.46	0.37	0.35	0.39
A2 (Bitiarguda Village)	RPM (µg / m3)														
	PM 2.5(60µg / m3)	60	31.6	29.7	27.4	21.5	13.86	19.8	21.64	22.89	28.51	30.42	30.52	31.22	25.75
	PM10(100µg / m3)	100	52.6	55.7	48.6	37.6	24.69	40.4	41.84	43.68	52.36	54.27	53.49	53.83	46.59
	NRPM (µg /m3)		55.9	58.8	49.3	40.4	26.41	43.9	44.85	48.31	58.58	59.29	58.13	57.16	50.09
	SPM(µg /m3)		109	114	97.9	78	51.1	84.3	86.69	91.99	110.94	113.56	111.62	110.99	96.69
	SO_2 (80 µg /m3)	80	8.21	7.06	7.36	6.29	4.64	6.27	7.26	7.29	8.04	7.23	8.32	8.36	7.19
	NO_X (80µg /m3)	80	16.4	14.2	16.7	15.5	11.62	13.3	13.42	13.52	13.67	13.37	12.62	13.75	14.00
	CO (2 mg /m3)	2	0.58	0.41	0.41	0.4	0.24	0.31	0.4	0.42	0.4	0.42	0.35	0.3	0.39
A3 (Goudguda village)	RPM (µg / m3)														
	PM 2.5(60µg / m3)	60	34.2	31.7	26.2	23.2	16.42	16.2	23.12	21.54	24.18	31.21	28.31	30.15	25.54
	PM10(100µg / m3)	100	54.8	57.6	45.9	40.8	29.81	33.9	42.4	44.19	50.27	56.14	49.51	50.94	46.34
	NRPM (µg /m3)		57.7	59.7	48.3	43.2	31.72	36.8	46.76	49.83	52.19	60.12	54.36	56.37	49.74
	SPM(µg /m3)		112	117	94.1	84.1	61.53	70.6	89.16	94.02	102.46	116.26	103.87	107.31	96.09
	SO_2 (80 µg /m3)	80	8.13	7.12	7.22	6.02	4.24	5.32	6.78	7.58	8.32	7.38	9.23	8.04	7.12
	NO_X (80µg /m3)	80	17.2	13.7	17.3	15.2	10.85	12.5	13.61	11.86	14.61	13.61	14.45	14.52	14.11
	CO (2 mg /m3)	2	0.49	0.44	0.43	0.42	0.23	0.32	0.43	0.4	0.42	0.38	0.34	0.34	0.39
A4 (Kakriguma village)	RPM (µg / m3)														
	PM 2.5(60µg / m3)	60	30.6	34.9	29.2	16.9	19.21	17.9	19.63	24.31	27.34	28.13	26.43	28.34	25.24
	PM10(100µg / m3)	100	53.9	58.4	47.4	30.7	35.76	35.1	37.52	49.37	51.49	50.82	50.23	49.59	45.85
	NRPM (µg /m3)		55.5	61.7	50.2	35.2	37.14	37.8	39.37	53.41	54.27	54.95	55.42	54.95	49.16
	SPM(µg /m3)		109	120	97.6	65.9	72.9	72.9	76.89	102.78	105.76	105.77	105.65	104.54	95.01
	SO_2 (80 µg /m3)	80	8.46	8.05	7.15	5.74	5.12	6.43	7.19	6.91	8.51	8.09	8.51	8.23	7.37
	NO_X (80µg /m3)	80	16.3	15.5	18.1	13.7	13.94	14.4	14.5	10.34	15.18	13.82	13.92	12.91	14.39
	CO (2 mg /m3)	2	0.52	0.52	0.44	0.36	0.31	0.3	0.41	0.39	0.39	0.4	0.36	0.32	0.39
A5 (Upper Meeting village)	RPM (µg / m3)														
	PM 2.5(60µg / m3)	60	35.8	35.2	31.2	19.6	22.93	21.6	22.76	28.52	29.12	34.85	31.51	32.17	28.77
	PM10(100µg / m3)	100	55.3	59.9	52.2	32.6	38.24	48.3	43.45	57.41	58.55	59.51	53.41	54.27	51.10
	NRPM (µg /m3)		58.6	64.4	55.7	34.9	42.43	51.6	47.22	62.98	66.32	63.64	57.21	59.64	55.38
	SPM(µg /m3)		114	124	108	67.5	80.67	100	90.67	120.39	124.87	123.15	110.62	113.91	106.48
	SO_2 (80 µg /m3)	80	8.3	8.19	8.24	6.46	6.41	7.51	7.39	7.12	9.23	7.36	8.48	9.05	7.81
	NO_X (80µg /m3)	80	17.9	16.8	20.3	16.6	15.73	16.7	14.42	12.61	17.29	11.95	13.83	16.73	15.91
	CO (2 mg /m3)	2	0.61	0.61	0.42	0.38	0.34	0.39	0.6	0.43	0.48	0.41	0.38	0.41	0.46
A6 (Near Main Haul Road Area)	RPM (µg / m3)														
	PM 2.5(60µg / m3)	60	40.6	35.2	39.8	26.2	31.19	29.5	30.81	32.91	38.25	44.54	37.16	37.51	35.30
	PM10(100µg / m3)	100	62.2	66.7	59.2	48.5	54.42	54.2	58.34	66.18	69.22	70.23	56.29	58.32	60.31
	NRPM (µg /m3)		65.3	69.6	63.5	53.7	58.51	56.3	62.51	70.51	78.95	74.22	61.6	66.72	65.12
	SPM(µg /m3)		127	136	123	102	112.9	110	120.25	136.69	148.17	144.45	117.87	125.04	125.38
	SO_2 (80 µg /m3)	80	9.21	9.21	9.38	7.85	8.26	10.7	9.24	9.15	10.64	8.17	12.24	13.42	9.79
	NO_X (80µg /m3)	80	20.2	19.5	24.6	19.5	18.81	24	20.64	16.75	21.76	15.21	20.21	19.47	20.05
	CO (2 mg /m3)	2	0.96	0.82	0.86	0.5	0.6	0.82	0.82	0.78	0.69	0.82	0.52	0.68	0.74

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Monitoring station	Parameter	Norm	Apr'22	May'22	Jun'22	Jul'22	Aug'22	Sep'22	Oct'22	Nov'22	Dec'22	Jan'23	Feb'23	Mar'23	Avg
A7 (Near Crusher House)	RPM (µg / m3)														
	PM 2.5(60µg / m3)	60	44.56	39.32	46.62	36.49	38.45	36.24	34.43	42.87	46.51	49.52	38.87	39.45	41.11
	PM10(100µg / m3)	100	66.07	69.83	68.36	60.48	61.13	68.76	63.63	80.72	79.34	78.31	58.17	59.4	67.85
	NRPM (µg /m3)		69.14	72.84	74.24	65.42	65.27	69.47	68.15	84.71	86.54	82.16	64.17	67.53	72.47
	SPM(µg /m3)		135.2	142.7	142.6	125.9	126	138.2	131.78	165.42	165.88	160.49	122.34	126.93	140.29
	SO_2 (80 µg /m3)	80	9.09	9.08	9.03	7.51	8.04	9.18	8.65	8.34	10.06	9.23	10.73	12.31	9.27
	NO_x (80µg /m3)	80	19.48	19.41	21.44	18.28	17.5	20.34	18.45	15.29	18.52	17.56	16.18	18.21	18.39
	CO (2 mg /m3)	2	0.84	0.74	0.71	0.47	0.49	0.69	0.78	0.68	0.58	0.76	0.48	0.57	0.65
A8 (Roof of the HEMM main building)	RPM (µg / m3)														
	PM 2.5(60µg / m3)	60	38.25	36.86	33.15	24.31	26.3	24.72	25.51	28.56	31.43	36.47	32.42	33.59	30.96
	PM10(100µg / m3)	100	58.86	59.22	55.42	42.17	39.57	50.52	51.81	58.64	61.48	69.12	53.76	53.15	54.48
	NRPM (µg /m3)		62.72	63.48	59.35	46.59	42.15	52.89	55.8	63.45	67.42	76.31	57.38	60.29	58.99
	SPM(µg /m3)		121.6	122.7	114.8	88.76	81.72	103.3	107.61	122.09	128.9	145.43	111.14	113.44	113.45
	SO_2 (80 µg /m3)	80	8.52	8.45	8.15	6.49	7.62	8.61	7.58	7.36	8.47	7.78	9.82	10.67	8.29
	NO_x (80µg /m3)	80	16.84	17.67	19.72	16.16	14.82	18.17	14.63	13.17	14.45	13.48	15.34	17.51	16.00
	CO (2 mg /m3)	2	0.78	0.66	0.53	0.52	0.42	0.52	0.53	0.57	0.47	0.54	0.36	0.42	0.53
A9 (Roof of Panchpatmali Bhavan)	RPM (µg / m3)														
	PM 2.5(60µg / m3)	60	39.87	35.51	35.41	25.5	24.12	27.83	29.4	30.65	34.21	39.21	34.51	34.62	32.57
	PM10(100µg / m3)	100	60.74	57.05	57.54	45.72	36.91	52.95	52.16	63.51	67.13	67.53	56.34	56.74	56.19
	NRPM (µg /m3)		65.56	62.26	61.17	49.61	40.32	55.78	57.69	96.63	76.26	70.58	60.41	61.48	63.15
	SPM(µg /m3)		126.3	119.3	118.7	95.33	77.23	108.7	109.85	133.14	143.39	138.11	116.75	118.22	117.09
	SO_2 (80 µg /m3)	80	9.43	8.52	9.41	7.07	7.38	9.45	8.31	9.42	10.82	9.68	10.25	13.59	9.44
	NO_x (80µg /m3)	80	18.32	16.86	20.65	19.07	19.65	19.48	16.54	19.28	20.21	16.12	19.72	21.35	18.94
	CO (2 mg /m3)	2	0.8	0.59	0.74	0.73	0.41	0.68	0.73	0.79	0.64	0.71	0.44	0.59	0.65
A10 (Near SMCP North Block)	RPM (µg / m3)														
	PM 2.5(60µg / m3)	60	37.64	36.27	28.23	18.84	17.41	29.17	22.35	27.54	28.68	37.18	34.51	32.71	29.21
	PM10(100µg / m3)	100	58.45	58.19	49.68	33.37	29.56	45.17	45.97	57.45	58.39	62.41	48.92	52.91	50.04
	NRPM (µg /m3)		63.68	60.51	52.52	37.32	32.76	47.16	49.41	62.89	62.17	68.43	52.62	59.81	54.11
	SPM(µg /m3)		122.1	118.7	102.2	70.69	62.32	92.33	95.38	120.34	120.56	130.84	101.54	112.72	104.15
	SO_2 (80 µg /m3)	80	8.71	7.43	8.53	6.04	4.53	7.24	7.62	8.91	9.73	8.26	9.58	11.71	8.19
	NO_x (80µg /m3)	80	17.5	14.55	19.88	18.61	12.43	15.71	14.82	14.66	17.58	14.33	14.96	19.18	16.18
	CO (2 mg /m3)	2	0.64	0.58	0.62	0.32	0.36	0.47	0.45	0.54	0.46	0.52	0.4	0.41	0.48

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ANNEXURE-II
FLOW RATES (Sl 25) OF SPRINGS AROUND PANCHPATMALI CENTRAL & NORTH BLOCK BAUXITE MINE (2022-23)

Stream water Quality Analysis with stream flow rate April 2022

SL. NO	Parameters	Sampling Station Code																
		G-1	G-2	G-3	G-4	G-5	G-6	G-7	G-8	G-9	G-10	G-11	G-12	G-13	G-14	G-15	G-16	G-17
		Litiguda	Jholaguda	Bhitara Bhejaput	Barigurha	Kapsiput	Litaputta	Murdagurha	Gaurhaguda	Tengulighurha	Kakirguma	Tentulipadar	Keler	Kusumaghurha	Kirajhola	Rangapani	Panaputa	Balipeta
1	Temp (°C)	30°C	30°C	30°C	30°C	29°C	30°C	29°C	29°C	29°C	29°C	30°C	30°C	30°C	30°C	20°C	30°C	29°C
2	pH Value	6.9	6.9	7	7	7	7	7	7	6.9	6.9	6.9	7	7	7	7	7	7
3	Dissolve Oxygen, mg/l	3.8	4	3.7	4.1	4	3.8	3.9	4	3.8	3.9	4	4	4	4	4.1	3.8	3.9
4	Total Dissolved Solids, mg/l	40	45	34	41	40	41	33	41	80	43	40	32	77	44	34	45	41
5	Total Hardness, (as $CaCO_3$), mg/l	38	44	42	36	28	26	22	30	68	42	32	25	68	35	25	48	38
6	Suspended solids mg/l	18	16	18	18	16	15	14	15	14	20	16	16	15	18	15	10	18
7	B.O.D mg/l 3 days at 27°C	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
8	Nitrate (as NO3), mg/l	4.5	3.9	4.8	3.8	4.9	4.6	4.7	3.2	2.8	2.8	4.6	4.5	3.2	3	2.5	2.8	3
9	Chloride as Cl – mg/l	4	6	22	36	34	30	32	8	18	6	12	8	6	4	10	9	7
10	Sulphate (as SO4), mg/l	18	16	18	18	16	15	14	15	<1.0	2	3	1	<1.0	<1.0	<1.0	<1.0	1
11	Calcium (as Ca), mg/l	12	14	10	14	10	8	4	6	22	16	10	9	18	10	9	11	10
12	Magnesium (as Mg), mg/l	1.9	1.9	4.13	0.243	0.97	1.45	2.9	3.6	2.9	0.486	1.9	0.607	5.8	2.43	0.607	4.86	3.16
13	Turbidity,(N.T.U.)	8.5	4.6	7.9	6.2	5	4.3	3.9	4.6	4.2	4.8	4.2	4.3	4.4	4.5	4	3.2	3.8
14	Fluoride as F, mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
15	Phenolic Compounds, (as C_6H_5OH) ,mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
16	Arsenic (as As), mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
17	Mercury (as Hg), mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
18	Lead (as Pb), mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
19	Cadmium (as Cd), mg/l	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
20	Chromium (as Cr^{+6}), mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
21	Copper (as Cu), mg/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
22	Zinc (as Zn) mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
23	Iron (as Fe), mg/l	0.86	0.43	0.36	0.25	0.55	0.76	0.73	0.84	0.36	0.45	0.56	0.64	0.92	0.88	0.76	0.86	0.76
24	Total Alkalinity (as $CaCO_3$), mg/l	30	40	68	70	65	68	60	60	54	58	52	69	68	78	65	78	72
25	STREAM FLOW RATE (m^3/sec)	3.597	1.152	0.551	0.873	1.217	0.916	1.6	1.496	0.609	1.011	0.34	1.065	0.588	0.722	0.809	0.562	0.284

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Stream water Quality Analysis with stream flow rate August 2022

SL. NO	Parameters	Sampling Station Code																
		G-1	G-2	G-3	G-4	G-5	G-6	G-7	G-8	G-9	G-10	G-11	G-12	G-13	G-14	G-15	G-16	G-17
		Litiguda	Jholaguda	Bhitara Bhejaput	Barigurha	Kapsiput	Litaputta	Murdaguda	Gaurhaguda	Tenguligurha	Kakirgoma	Tentulipadar	Keler	Kusumagurha	Kirajhola	Rangapani	Pansaputa	Balipeta
1	Temp (°C)	28°C	28°C	28°C	30°C	30°C	30°C	30°C	28°C	28°C	28°C	29°C	28°C	29°C	20°C	36°C	30°C	28°C
2	pH Value	7	7	7	7	6.8	6.8	7	7	7	7	7	6.8	6.8	6.8	7	7	7
3	Dissolve Oxygen, mg/l	4.1	3.9	3.9	4	4.2	4.1	4	4.2	4.2	4	3.9	4.4	4.2	4	4.2	4.1	4
4	Total Dissolved Solids, mg/l	75	36	27	37.5	58	36	37	105	105	30	67	31	58	29	29	26	64
5	Total Hardness, (as $CaCO_3$), mg/l	40	20	24	210	28	16	24	52	52	20	44	20	20	24	24	20	56
6	Suspended solids mg/l	21	17	13	15	16	14	25	23	23	20	21	18	19	24	23	20	21
7	B.O.D mg/l 3 days at 27°C	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
8	Nitrate (as NO3), mg/l	4.8	5.2	4.3	4.4	8.6	7.9	4.3	5.6	5.6	6.8	6.7	5.5	6.8	4.9	5.8	6.4	3.6
9	Chloride as Cl - mg/l	4	4	4	120	4	4	4	2	2	3	4	3	2	2	6	4	7
10	Sulphate (as SO4), mg/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	3	3	< 1.0	3	< 1.0	< 1.0	< 1.0	<1.0	<0.1	4
11	Calcium (as Ca), mg/l	11	6	5	16	8	6	6	19	19	6	18	3	6	6	5	3	18
12	Magnesium (as Mg), mg/l	3	0.972	3	42	2	<0.243	2	0.972	0.972	0.972	<0.243	3	0.972	2	3	3	3
13	Turbidity,(N.T.U.)	10.5	110	90.4	75	65	55	56	40	40	42	38	40	45	48	30	38	26
14	Fluoride as F , mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<1.0
15	Phenolic Compounds, (as C_6H_5OH) ,mg/l	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
16	Arsenic (as As), mg/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
17	Mercury (as Hg), mg/l	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
18	Lead (as Pb), mg/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
19	Cadmium (as Cd), mg/l	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
20	Chromium (as Cr^{+6}), mg/l	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
21	Copper (as Cu), mg/l	< 0.04	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.04	< 0.04	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.04	< 0.02	< 0.02
22	Zinc (as Zn) mg/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
23	Iron (as Fe), mg/l	0.962	0.662	0.553	0.862	1.072	0.462	0.668	0.967	0.967	0.432	0.76	0.556	0.829	0.672	0.962	0.805	0.811
24	Total Alkalinity (as $CaCO_3$), mg/l	46	40	42	200	24	22	48	40	40	42	40	48	32	24	42	40	44
25	STREAM FLOW RATE (m^3/sec)	5.876	1.504	0.689	1.222	1.452	1.022	1.948	1.783	0.835	1.425	0.457	1.169	0.74	0.943	1.023	0.729	0.364

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Stream water Quality Analysis with stream flow rate November 2022

SL. NO	Parameters	Sampling Station Code																
		G-1	G-2	G-3	G-4	G-5	G-6	G-7	G-8	G-9	G-10	G-11	G-12	G-13	G-14	G-15	G-16	G-17
		Litiguda	Jholaguda	Bhitara Bhejapot	Barigurha	Kapsipot	Litaputta	Murdaguda	Gaurhagud a	Tenguligur ha	Kakirgum a	Tentulipad ar	Keler	Kusumagur ha	Kirajhola	Rangapani	Pansaputa	Balipeta
1	Temp (°C)	18°C	18°C	18°C	20°C	20°C	18°C	18°C	18°C	18°C	18°C	20°C	20°C	20°C	20°C	18°C	18°C	20°C
2	pH Value	6.8	6.8	6.8	6.8	6.8	6.8	6.9	6.9	6.8	6.8	6.8	6.9	6.8	6.8	6.9	6.8	6.8
3	Dissolve Oxygen, mg/l	3.9	3.8	4	4.2	3.9	4.1	4	3.9	4	3.8	4.2	3.8	3.9	4.1	4	4.1	4
4	Total Dissolved Solids, mg/l	22	25	24	23	18	23	23	23	24	30	25	26	25	37	27	24	24
5	Total Hardness, (as $CaCO_3$), mg/l	16	18	17	18	10	18	18	20	18	22	20	22	22	26	22	18	20
6	Suspended solids mg/l	6.5	6.6	6.2	6.3	6.1	6.4	6.2	6.1	6.2	6.2	6.1	6.4	6.3	6.2	6.1	6.1	6.3
7	B.O.D mg/l 3 days at 27°C	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
8	Nitrate (as NO3), mg/l	4.2	4	5.6	7.2	7.4	5.8	6.2	5.6	4.9	7.6	3.8	4.8	6.6	2.2	4.6	3.6	3.8
9	Chloride as Cl - mg/l	2	2	2	2	2	2	2	2	3	2	3	4	6	2	2	4	3
10	Sulphate (as SO4), mg/l	2	3	4	2	<1.0	3	2	1	<1.0	8	5	4	6	4	<0.01	<0.01	<0.01
11	Calcium (as Ca), mg/l	4.8	3	4.8	5.6	3.2	4	5.2	5.2	4	4.8	3.6	5.5	4	3	3.8	5.6	4.5
12	Magnesium (as Mg), mg/l	0.972	2.5	1.2	0.972	0.486	1.94	1.21	1.7	2.94	2.43	1.99	2	2.916	1.458	3.03	1.944	2.12
13	Turbidity,(N.T.U.)	10	12	18	10	10	15	18	25	26	15	42	38	35	40	30	25	28
14	Fluoride as F , mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
15	Phenolic Compounds, (as C_6H_5OH) ,mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
16	Arsenic (as As), mg/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
17	Mercury (as Hg), mg/l	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
18	Lead (as Pb), mg/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
19	Cadmium (as Cd), mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
20	Chromium (as Cr^{+6}), mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
21	Copper (as Cu), mg/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
22	Zinc (as Zn) mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
23	Iron (as Fe), mg/l	<0.05	0.06	0.08	0.136	0.262	0.0.92	0.116	0.243	0.243	0.462	0.105	0.226	0.198	0.232	0.118	0.38	0.462
24	Total Alkalinity (as $CaCO_3$), mg/l	12	14	13	14	14	15	16	18	18	16	14	14	16	26	30	18	19
25	STREAM FLOW RATE (m^3/sec)	3.701	1.024	0.52	0.802	1.143	0.777	1.44	1.479	0.564	0.963	0.315	1.065	0.588	0.646	0.799	0.535	0.266

SANJAYA KUMAR PATNAIK
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Stream water Quality Analysis with stream flow rate January 2023

SL. NO	Parameters	Sampling Station Code																
		G-1	G-2	G-3	G-4	G-5	G-6	G-7	G-8	G-9	G-10	G-11	G-12	G-13	G-14	G-15	G-16	G-17
		Litiguda	Jholaguda	Bhitara Bhejapot	Barigurha	Kapsipot	Litaputta	Murdagurh a	Gaurhagud a	Tengaligur ha	Kakirpum a	Tentulipad ar	Keler	Kusumagur ha	Kirajhola	Rangapani	Pansaputa	Balipeta
1	Temp (°C)	20.1°C	20.6°C	20.6°C	21.2°C	21.6°C	20.5°C	20.7°C	21.5°C	21.6°C	21.7°C	20.5°C	20.6°C	21.5°C	21.8°C	21.6°C	20.3°C	20.9°C
2	pH Value	7.1	7.2	7	7.3	7.2	7	7.1	7.2	7.3	7.4	7	7.2	7.1	7	7.3	7.4	7.2
3	Dissolve Oxygen, mg/l	3.9	3.8	4	3.7	4.1	4.2	4	3.8	3.7	4	3.9	4.1	3.8	3.8	3.8	3.9	4
4	Total Dissolved Solids, mg/l	14	14	31	13	19	15	63	23	42	27	9	70	28	11	175	33	15
5	Total Hardness, (as $CaCO_3$), mg/l	28	28	20	25	20	22	64	22	44	20	8	64	22	8	100	28	18
6	Suspended solids mg/l	16	17	22	12	30	18	60	28	36	25	15	64	26	12	24	30	20
7	B.O.D mg/l 3 days at 27°C	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
8	Nitrate (as NO3), mg/l	2.2	1.6	1.8	3.2	2.9	2.4	4.2	2.2	1.6	2.9	3.2	2.2	1.5	4.2	4.4	2.9	2.6
9	Chloride as Cl - mg/l	4	3	4	2	4	6	4	6	8	7	6	8	5	5	64	4	4
10	Sulphate (as SO4), mg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	6	<1.0	<1.0	25	2	<1.0
11	Calcium (as Ca), mg/l	4.8	2	2.5	3	4.9	4	16	2.9	9.6	1.6	1.4	22.4	1.6	1.2	2.7	4	3
12	Magnesium (as Mg), mg/l	4	1.6	1.8	1.2	1.9	2.9	6	<0.243	5	<0.243	<0.243	1.9	<0.243	<0.243	8	4.3	2.5
13	Turbidity,(N.T.U.)	10	13	7	20	32	7	<1.0	9	3.2	33	2.5	3.8	45	1.8	<1.0	<1.0	29
14	Fluoride as F , mg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
15	Phenolic Compounds, (as C_6H_5OH) ,mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
16	Arsenic (as As), mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
17	Mercury (as Hg), mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
18	Lead (as Pb), mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
19	Cadmium (as Cd), mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
20	Chromium (as Cr^{+6}), mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
21	Copper (as Cu), mg/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
22	Zinc (as Zn) mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
23	Iron (as Fe), mg/l	0.216	0.562	0.288	0.167	0.059	0.862	0.542	0.116	0.205	0.09	<0.05	<0.05	<0.05	<0.05	0.643	0.243	0.226
24	Total Alkalinity (as $CaCO_3$), mg/l	54	63	69	68	59	54	53	64	68	56	71	65	66	69	70	69	67
25	STREAM FLOW RATE (m^3/sec)	3.77	1.169	0.575	0.908	1.209	0.754	1.449	1.531	0.69	1.011	0.364	1.065	0.588	0.674	0.798	0.546	0.29

SANJAYA KUMAR PATNAIK
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ANNEXURE-III

GROUND WATER QUALITY ANALYSIS AROUND PANCHPATMALI CENTRAL & NORTH BLOCK BAUXITE MINE (2022-23)

SANJAYA KUMAR PATNAIK
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Panchpatmali Bauxite Mine
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For April 2022

Sl. No	Name of Tests	Permissible Limits	GW-1 Metingi Village	GW-2 Chhatamba Village	GW-3 Panasaput	GW-4 Jhariapadar	GW-5 Tentulipadar	GW-6 Ichhapur	GW-7 Mundagadati	GW-8 Bijaghati Village	GW-9 Putraghati Village	GW-10 Chararha Village	GW-11 Kapsiput Village	GW-12 Jambagurha Village	GW-13 Shriguda Village	GW-14 Kakirigumа Village	GW-15 Sorishapadar Village
1	$_{p}H$ at 30°C	6.5-8.5	6.8	6.9	6.9	6.8	6.8	6.9	6.9	6.8	6.8	6.8	6.8	6.9	6.9	6.8	6.9
2	D.O. (mg/l)	-	3.5	3.2	3.8	4	3.9	3.7	3.2	4	4.1	3.6	3.5	3.8	3.5	3.9	3.9
3	T.D.S (mg/l)	2000	160	60	69	54	40	55	321	93	67	114	32	113	56	33	53
4	Total Hardness. as $CaCo_3$	600	100	60	48	48	42	44	140	50	88	72	40	84	36	40	44
5	Total Alkalinity (as $CaCo_3$) (mg/l)	600	75	16	20	16	20	24	25	28	64	18	16	15	12	20	36
6	B.O.D.	30	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
7	Nitrate as No_3 (mg/l)	45	1.6	2.2	0.98	3.2	1.2	2.5	2	4.6	2.9	2.4	1.6	1.8	2	2.2	2.3
8	Chlorides as Cl (mg/l)	1000	32	8	10	10	15	16	18	20	20	22	8	16	12	8	8
9	Sulphate as SO_4 (mg/l)	400	30	4	8	4	2	5	30	15	4	10	2	25	3	3	4
10	Calcium as Ca (mg/l)	200	29	22	16	18	16	11	32	13	20	19	15	18	10	8	11
11	Magnesium as Mg (mg/l)	100	6.8	1.2	1.9	0.729	0.486	3.88	14.6	4.25	9.2	5.8	0.607	9.7	2.67	4.9	4
12	Turbidity (NTU)	10	1.6	2	12	2	4.8	3.5	2.8	12	10	4.8	3	3.2	2.8	3	5.4
13	Fluoride as F (mg/l)	1.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
14	Phenlic compounds as C_6H_5OH (mg/l)	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
15	Arsenic as As (mg/l)	0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
16	Mercury as Hg (mg/l)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
17	Lead as Pb (mg/l)	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
18	Cadmium as Cd (mg/l)	0.01	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
19	Chromium Cr^{+6} (mg/l)	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Copper as Cu (mg/l)	1.5	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
21	Zinc as Zn (mg/l)	15	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
22	Iron as Fe (mg/l)	1	0.269	0.135	0.226	0.437	0.296	0.362	0.462	0.254	0.338	0.305	0.362	0.229	0.288	0.306	0.397
23	Temperature in 0C	-	28°C	28°C	29°C	29°C	29°C	28°C	28°C	28°C	29°C	29°C	28°C	28°C	29°C	298°C	29°C
24	Coliform (MPN)	ND in 100ml	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent

Norm as per IS 10500:2012

For August 2022

Sl. No	Name of Tests	Permissible Limits	GW-1 Metingi Village	GW-2 Chhatamba Village	GW-3 Panasaput	GW-4 Jhariapadar	GW-5 Tentulipadar	GW-6 Ichhapur	GW-7 Mundagadati	GW-8 Bijaghati Village	GW-9 Putraghati Village	GW-10 Chararha Village	GW-11 Kapsiput Village	GW-12 Jambagurha Village	GW-13 Shriguda Village	GW-14 Kakirigumma Village	GW-15 Sorishapadar Village
1	pH at 30°C	6.5-8.5	6.6	6.8	6.9	6.7	6.8	6.9	6.6	6.7	6.8	6.8	6.73	6.7	6.6	6.8	6.8
2	D.O. (mg/l)	-	3.8	3.9	4	4	4.2	4.1	3.8	3.8	3.7	3.5	3.5	3.6	3.9	4	3.9
3	T.D.S (mg/l)	2000	232	66	76	49	98	327	389	107	96	461	361	66	100.9	64	75
4	Total Hardness. as $CaCo_3$	600	106	44	48	20	80	216	132	48	64	216	132	40	36	32	28
5	Total Alkalinity (as $CaCo_3$) (mg/l)	600	52	52	40	2-	28	164	32	40	72	92	64	8	4	4	12
6	B.O.D.	30	<0.0 3	<0.0 3	<0.0 3	<0.0 3	<0.0 3	<0.0 3	<0.0 3	<0.0 3	<0.0 3	<0.0 3	<0.0 3	<0.0 3	<0.0 3	<0.0 3	<0.0 3
7	Nitrate as No_3 (mg/l)	45	2.8	2.6	3.4	3.2	3.3	3.3	2.5	2.3	2.2	2.8	2.9	2.6	1.6	2.2	2.3
8	Chlorides as Cl (mg/l)	1000	44	4	8	8	20	36	100	20	12	108	32	4	8	16	8
9	Sulphate as SO_4 (mg/l)	400	<1.0	2	4	1	8	10	75	10	2	10.8	90	15	3	2	10
10	Calcium as Ca (mg/l)	200	27.2	11.2	11.2	8	17.6	59	38	11	16	53	32	9	8	9.6	8
11	Magnesium as Mg (mg/l)	100	12	3.88	4.86	<0.243	8.7	16.5	8.7	4.9	5.8	20.4	12.6	3.8	6.8	1.944	1.9
12	Turbidity (NTU)	10	4.2	4.6	4.5	5.8	3.5	72	65	96	8.8	6.5	4.6	5.8	10.8	12.6	25
13	Fluoride as F (mg/l)	1.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
14	Phenlic compounds as C_6H_5OH (mg/l)	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
15	Arsenic as As (mg/l)	0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
16	Mercury as Hg (mg/l)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
17	Lead as Pb (mg/l)	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
18	Cadmium as Cd (mg/l)	0.01	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
19	Chromium Cr^{+6} (mg/l)	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Copper as Cu (mg/l)	1.5	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
21	Zinc as Zn (mg/l)	15	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
22	Iron as Fe (mg/l)	1	0.323	0.306	0.225	0.116	0.106	0.152	0.246	0.288	0.303	0.298	0.304	0.306	0.304	0.225	0.362
23	Temperature in 0C	-	28°C	28°C	26°C	26°C	28°C	27°C	28°C	27°C	26°C	25°C	27°C	26°C	26°C	26°C	28°C
24	Coliform (MPN)	ND in 100ml	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent

Norm as per IS 10500:2012

SANJAYA KUMAR PATNAIK
General Manager(Env.)
Panchpatmali Bauxite Mine
NALCO, Damanjodi-763008

For Nov 2022

Sl. No	Name of Tests	Permissible Limits	GW-1 Metingi Village	GW-2 Chhatamba Village	GW-3 Panasaput	GW-4 Jhariapadar	GW-5 Tentulipadar	GW-6 Ichhapur	GW-7 Mundagadati	GW-8 Bijaghati Village	GW-9 Putraghati Village	GW-10 Chararha Village	GW-11 Kapsiput Village	GW-12 Jambagurha Village	GW-13 Shriguda Village	GW-14 Kakirigumma Village	GW-15 Sorishapadar Village
1	pH at 30°C	6.5-8.5	6.9	6.9	6.8	6.8	6.9	6.9	6.8	6.9	6.9	6.8	6.8	6.9	6.9	6.9	6.8
2	D.O. (mg/l)	-	4.5	4.3	4.5	4.4	4.2	4.1	4.1	4.2	4.6	4.4	4.4	4.5	4.2	4.3	4.4
3	T.D.S (mg/l)	2000	175	69	65	317	96	124	316	84	92	120	132	63	4	169	166
4	Total Hardness. as $CaCo_3$	600	92	56	50	126	52	84	80	32	68	78	74	44	26	72	78
5	Total Alkalinity (as $CaCo_3$) (mg/l)	600	36	48	42	68	40	64	78	30	90	42	24	50	22	46	22
6	B.O.D.	30	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
7	Nitrate as No_3 (mg/l)	45	1.2	1.6	1	0.9	0.86	0/42	1.1	1.08	1.2	1.5	1.4	1.3	0.8	1.1	2.8
8	Chlorides as Cl (mg/l)	1000	36	2	10	82	6	18	100	10	2	16	24	2	4	40	48
9	Sulphate as SO_4 (mg/l)	400	10	3	2	20	3	5	12	<1.0	<1.0	10.2	8.6	<1.0	2	8	9
10	Calcium as Ca (mg/l)	200	22	11	16	30	11	22	18	10	17.6	18	17.6	11	5.6	20	20.8
11	Magnesium as Mg (mg/l)	100	8.7	6.8	2.4	12.2	5.8	6.8	8.3	1.5	5.8	7.8	7.8	7.3	2.9	5.3	6.3
12	Turbidity (NTU)	10	1	12	11	<1.0	1.3	1.2	3.5	4.2	1.1	1.3	1.2	1.2	1.3	2.8	1.2
13	Fluoride as F (mg/l)	1.5	0.09	0.06	0.05	0.243	0.161	0.082	0.08	0.112	0.06	0.07	0.122	0.226	0.227	0.221	0.162
14	Phenlic compounds as C_6H_5OH (mg/l)	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
15	Arsenic as As (mg/l)	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
16	Mercury as Hg (mg/l)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
17	Lead as Pb (mg/l)	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
18	Cadmium as Cd (mg/l)	0.01	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
19	Chromium Cr^{+6} (mg/l)	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Copper as Cu (mg/l)	1.5	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
21	Zinc as Zn (mg/l)	15	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
22	Iron as Fe (mg/l)	1	<0.05	<0.05	<0.05	<0.05	0.16	0.13	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
23	Temperature in 0C	-	18°C	18°C	18°C	18°C	18°C	18°C	20°C	20°C	20°C	20°C	20°C	20°C	20°C	20°C	20°C
24	Coliform (MPN)	ND in 100ml	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent

Norm as per IS 10500:2012

SANYAKUMAR PATNAIK
General Manager(Env.)
Panchpatmali Bauxite Mine
NALCO, Damanjodi-763008

For Jan 2023

Sl. No	Name of Tests	Permissible Limits	GW-1 Metingi Village	GW-2 Chhatamba Village	GW-3 Panasaput	GW-4 Jhariapadar	GW-5 Tentulipadar	GW-6 Ichhapur	GW-7 Mundagadati	GW-8 Bijaghati Village	GW-9 Putraghati Village	GW-10 Chararha Village	GW-11 Kapsiput Village	GW-12 Jambagurha Village	GW-13 Shriguda Village	GW-14 Kakirigumma Village	GW-15 Sorishapadar Village
1	pH at 30°C	6.5-8.5	6.6	6.8	6.7	6.8	6.6	6.8	6.7	6.8	6.8	6.8	6.6	6.8	6.7	6.8	6.8
2	D.O. (mg/l)	-	3.2	3.6	3.8	3.2	3.3	3.8	3.6	3.5	3.7	3.6	3.2	3.4	3.8	3.9	3.7
3	T.D.S (mg/l)	2000	179	58	15	8	140	201	87	14	136	35	21	9	31	39	39
4	Total Hardness. as $CaCo_3$	600	104	16	16	12	140	200	76	4	84	24	24	16	28	32	32
5	Total Alkalinity (as $CaCo_3$) (mg/l)	600	20	8	12	8	116	160	64	8	28	12	20	12	16	36	16
6	B.O.D.	30	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
7	Nitrate as No_3 (mg/l)	45	4.6	3.8	4.2	4	3.2	2.9	2.6	2.2	2	2.5	2	2.8	1.8	2.9	3
8	Chlorides as Cl (mg/l)	1000	68	4	4	4	4	8	36	4	4	4	4	4	4	4	4
9	Sulphate as SO_4 (mg/l)	400	30	6	<1.0	<1.0	6	12	2	<1.0	18	2	<1.0	<1.0	3	2	4
10	Calcium as Ca (mg/l)	200	32	6.4	6.4	6.4	33.6	38.4	22	1.6	18	3.2	8	6	11	8	5
11	Magnesium as Mg (mg/l)	100	5.8	<0.243	<0.243	<0.243	13.6	25.3	5	<0.243	9.7	3.8	9.8	<0.243	<0.243	2.9	4.8
12	Turbidity (NTU)	10	<1.0	1.3	<1.0	<1.0	<1.0	7.8	1	<1.0	4.2	1.3	40	<1.0	<1.0	<1.0	7
13	Fluoride as F (mg/l)	1.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
14	Phenlic compounds as C_6H_5OH (mg/l)	0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
15	Arsenic as As (mg/l)	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
16	Mercury as Hg (mg/l)	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
17	Lead as Pb (mg/l)	0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
18	Cadmium as Cd (mg/l)	0.01	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
19	Chromium Cr^{+6} (mg/l)	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
20	Copper as Cu (mg/l)	1.5	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
21	Zinc as Zn (mg/l)	15	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
22	Iron as Fe (mg/l)	1	0.762	0.286	<0.5	<0.5	0.527	0.203	0.362	0.09	0.116	0.102	0.116	<0.05	0.462	0.386	0.662
23	Temperature in 0C	-	20.2°C	20.6°C	21.5°C	19.6°C	20.5°C	20.6°C	19.8 °C	20.8°C	20.8 °C	21.1 °C	20.6 °C	20.8 °C	20.2°C	19.9°C	19.8 °C
24	Coliform (MPN)	ND in 100ml	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent

Norm as per IS 10500:2012

SANJAY KUMAR PATNAIK
General Manager(Env.)
Panchmahali Bauxite Mines
NALCO, Damanjodi-764021

ANNEXURE-IV

STATUS OF COMPLIANCE OF MEASURES TO BE TAKEN UP BY NALCO WITHIN THE PROJECT AREA OF PANCHPATMALI BAUXITE MINE (CENTRAL & NORTH BLOCK ML) AS PER APPROVED WILD LIFE MANAGEMENT PLAN

Sl.No.	Para ref.	Item of Work	Status as on 30.9.2022
1	3. b) i) 1.	Soil and moisture conservation in the ML area	Top soil excavated is used in concurrent reclamation of mined out area and is 100% utilised. All the rainfall in mined out area percolates into the ground without being discharged outside due to presence of in-situ barrier all around the mine. Besides rich growth of plantation and grass in the mined out area helps the soil to retain optimum moisture.
2	3. b) i) 2.	Grass seeding in hill slopes one year prior to plantation	Every year grass turfing with local grass is done in slopes in ML area. Grass turfing carried out during 2022-23 is 7000 sqr.mtr.
3	3. b) i) 3.	Water harvesting structure in the Central Location of the lease where normally stray cattle congregate 40 m length x 30 m width x 3 m depth at the central point.	Three Nos of water harvesting structures do exist over Panchpatmali Bauxite Mine to take care of the need of stray cattle and other wildlife.
4	3. b) i) 4.	Fire line inside already reclaimed areas prior to commencement of the season (January to June) 20 km	Every year lemon grass @75000 sq.mtr appx. is being removed inside the reclaimed area as total area clearance to prevent spread of fire.
5	3.b) i) 5.	Watch and ward (10 nos) to prevent spread of fire will be looked after by NALCO	Watch and ward @14 nos per day are being deployed to prevent spread of fire.
6	3. b) i) 6.	Signage depicting messages to workers to protect the planted species / their vernacular name and usages and their medicinal value.	Signage board on plantation & Environmental issues have been provided.
7	3 b) i) 7	Awareness campaign amongst the workers regarding the ecological / ethnic values of forest	Every year awareness campaign is being organised to spread awareness among employees regarding ecological / ethnic values of forest through World Environment Day , Vana Mahotsav Week , MEMC Week, etc.
8	3. b)i) 8.	Solar Fencing around Red Mud Pond over 3.0 Kms.	The red mud pond is located beyond the buffer zone of Panchpatmali Bauxite Mine. Further no elephant habitat exists in the core or buffer zone of Panchpatmali Bauxite Mine.

27/06/23

(Rasheed Waris)
Group General Manager(Mines)

ANNEXURE-V

AMBIENT NOISE LEVEL MEASUREMENT IN AND AROUND PANCHPATMALI CENTRAL & NORTH BLOCK BAUXITE MINE FOR 2022-23

Sl.	Monitoring station code & its direction	Date	Noise level dB(A)		Date	Noise level dB(A)		Date	Noise level dB(A)		Date	Noise level dB(A)	
			Day	Night		Day	Night		Day	Night		Day	Night
1	Baiguda Village-SW	21.04.22	52.6	30.1	22.08.2022	48.9	34.8	19.11.2022	51.2	30.1	17.01.2023	49.2	31.5
2	Bitiarguda Village-W	21.04.22	50.8	32.5	22.08.2022	50.2	34.6	19.11.2022	53.4	35.2	17.01.2023	47.6	33.5
3	Goudgida Village-NW	21.04.22	53.6	34.6	22.08.2022	47.8	29.5	19.11.2022	47.1	39.5	17.01.2023	52.7	35.2
4	Kakriguma Village N	21.04.22	48.8	38.5	22.08.2022	46.9	33.9	19.11.2022	50.3	37.2	17.01.2023	48.8	38.1
5	Upper Meeting Village- NE	21.04.22	46.7	40.6	22.08.2022	50.2	36.7	19.11.2022	49.5	39.4	17.01.2023	48.2	36.5
6	Near Main Haul Road- E	21.04.22	50.2	42.5	22.08.2022	52.6	37.6	19.11.2022	52.1	38.2	17.01.2023	53.1	31.5
7	Near Crusser House- SE	21.04.22	50.6	36.5	22.08.2022	50.8	37.2	19.11.2022	45.2	38.1	17.01.2023	48.5	33.1
8	Near Hemm Main Building- SW	21.04.22	43.4	39.6	22.08.2022	53.6	36.8	19.11.2022	47.5	43.1	17.01.2023	47.7	35.6
9	Roof Of Panchpatmali Bhawan- S	21.04.22	53.3	40.9	22.08.2022	44.8	33..4	19.11.2022	51.6	33.1	17.01.2023	53.6	38.5
10	Near Smcp North Block-NE	21.04.22	46.6	36.5	22.08.2022	46.6	32.1	19.11.2022	53.2	38.4	17.01.2023	53.8	33.2

Norm

Category of area/zone		Limits in dB(A) Leq	
		Day time	Night time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence zone	50	40

SANJAYA KUMAR PATNAIK
General Manager(Env.)
Panchpatmali Bauxite Mine
NALCO, Damanjodi-763008

ANNEXURE-VI
WASTE WATER ANALYSIS AT PANCHPATMALI CENTRAL & NORTH BLOCK BAUXITE MINE
(2022-23)

Sl. No.	Parameter	NORM	WW1												WW2												Average	
			Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	WW1	WW2
1	Temperature (°C)	-	30	28	28	15	30	28	22	20	20	21.8	28.3	28	30	28	28	15	30	28	22	20	20	21.6	28.6	28	24.280	24.260
2	pH Value	5.5-9.0	7	7	6.8	7	7	7	7	7	7	7	7	7	7	7	6.8	7	7	7	7	7	7	7.2	6.9	6.9	6.980	7.000
3	Dissolve Oxygen, mg/l	-	3.9	1.2	3.8	3.9	3.8	3.8	3.9	3.8	3.4	3.5	6	3.5	3.8	1	3.7	3.8	3.7	3.89	3.8	3.7	3.8	3.3	6.8	3.6	3.500	3.449
4	Total Dissolved Solids, mg/l	-	53	143	102	118	123	92	109	208	144	50	179	229	51	151	120	109	135	98	80.7	204	143	66	175	252	114.160	115.756
5	Total Hardness (as $CaCO_3$), mg/l	-	30	88	68	72	52	60	52	68	106	24	152	84	14	72	68	64	52	44	48	62	110	20	144	84	62.000	55.400
6	Suspended Solids mg/l	100	10	10	10	6	18	18	12	13	12	20	7	2	18	16	12	8	20	20	18	10	10	22	11	1	12.900	15.400
7	B.O.D mg/l 3 days at	30	<3.0	<3.0	<3.0	<3.0	<3.0	18	24	15	17	<3.0	18	21	<3.0	<3.0	<3.0	<3.0	<3.0	15	18	10	12	<3.0	24	16	<3.0	<3.0
8	C.O.D mg/l	-	6	57	4	27	8	210	120	60	64	75	57	106	8	60	6	81	7	90	88	45	56	60	65	82	63.100	50.100
9	Nitrate (as NO3), mg/l	-	2.5	2.8	4.8	9.5	7.6	8.6	4.6	1.5	5.5	4.8	4.5	4.5	2.8	18.1	6.6	5.8	8.2	7.8	3.8	1.8	6.8	4.5	5.6	8.6	5.220	6.620
10	Chloride as Cl – mg/l	-	20	56	8	16	12	10	32	46	17	20	16	128	16	60	16	12	32	12	12	54	17	16	16	132	23.700	24.700
11	Sulphate (as SO4), mg/l	-	5	3	8	5	8	6	1	25	12.6	4	4	8.5	7	<1.0	6	4	10	18	<1.0	22	13.7	3	4	8.8	7.760	10.463
12	Calcium (as Ca), mg/l	-	7.2	19.2	20.8	20.8	12.8	16	13	19	29.6	8	35	25.6	4	23.2	17.6	16	16	16	11.2	17	28.8	5	37	25.6	16.640	15.480
13	Magnesium (as Mg), mg/l	-	2.9	9.72	3.9	4.9	4.8	4.8	4.8	4.86	7.8	0.97	16	4.86	0.97	0.972	5.9	5.8	2.9	0.97	4.8	4.86	9.2	1.94	13	4.86	4.945	3.831
14	Fluoride as F , mg/l	2	1	<0.1	<0.1	<0.1	<0.1	0.73	<0.1	0.262	<0.1	<0.1	0.42	< 0.1	1.2	<0.1	<0.1	<0.1	<0.1	0.77	<0.1	0.29	0.12	<0.1	<0.1	< 0.1	0.662	0.595
15	Phenolic Compounds, (as C_6H_5OH) ,mg/l	1	<0.001	<0.002	<0.002	<0.002	< 0.002	<0.002	<0.02	<0.001	<0.01	< 1.0	< 1.0	0.06	<0.001	<0.002	<0.02	<0.02	< 0.002	<0.02	<0.02	<0.001	<0.01	< 1.0	< 1.0	0.09	<0.001	<0.001
16	Arsenic (as As), mg/l	0.2	<0.05	<0.05	<0.01	<0.05	< 0.01	<0.05	<0.05	<0.01	<0.2	< 0.01	< 0.2	< 0.01	<0.05	<0.05	<0.01	<0.05	< 0.01	<0.05	<0.05	<0.01	<0.2	< 0.01	< 0.2	< 0.01	<0.05	<0.05
17	Mercury (as Hg), mg/l	0.01	<0.001	<0.001	<0.01	<0.001	< 0.001	<0.001	<0.001	<0.001	<0.01	< 0.001	< 0.01	< 0.01	<0.001	<0.001	<0.001	<0.01	< 0.001	<0.001	<0.01	<0.001	<0.01	< 0.00	< 0.01	< 0.01	<0.001	<0.001
18	Lead (as Pb), mg/l	0.1	<0.01	<0.01	<0.01	<0.01	< 0.01	<0.01	<0.01	<0.01	<0.1	< 0.01	< 0.1	< 0.01	<0.01	<0.01	<0.01	<0.01	< 0.01	<0.01	<0.01	<0.01	<0.1	< 0.01	< 0.1	< 0.01	<0.01	<0.01
19	Cadmium (as Cd), mg/l	2	<0.01	<0.01	<0.01	<0.01	< 0.003	<0.01	<0.01	<0.01	<0.003	< 0.01	< 0.002	< 0.01	<0.001	<0.01	<0.01	<0.01	< 0.003	<0.01	<0.01	<0.01	<0.003	< 0.01	< 0.002	< 0.01	<0.01	<0.01
20	Chromium (as Cr^{+6}), mg/l	0.1	<0.05	<0.05	<0.05	<0.05	< 0.05	<0.05	<0.05	<0.05	<0.1	< 0.05	< 0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	< 0.05	<0.05	<0.05	<0.05	<0.1	< 0.05	< 0.1	< 0.05	<0.05	<0.05
21	Copper (as Cu), mg/l	3	<0.04	<0.04	<0.04	<0.03	< 0.04	<0.04	<0.04	<0.04	<0.04	< 0.04	< 0.04	< 0.04	<0.04	<0.04	<0.04	<0.03	< 0.04	<0.04	<0.04	<0.04	<0.04	< 0.04	< 0.04	< 0.04	<0.04	<0.04
22	Zinc (as Zn) mg/l	5	<0.01	<0.01	<0.01	<0.01	< 0.01	<0.01	<0.01	<0.01	<0.01	< 0.01	< 0.01	< 0.01	<0.01	<0.01	<0.01	<0.01	< 0.01	<0.01	<0.01	<0.01	<0.01	< 0.01	< 0.01	< 0.01	<0.01	<0.01
23	Iron (as Fe), mg/l	3	0.6	<0.1	0.83	0.03	0.96	1	0.67	0.226	0.36	1	2.29	0.203	1.058	<0.1	0.98	1.22	0.89	1.2	0.56	0.38	0.45	0.65	2.27	0.215	0.629	0.821
24	Oil and grease	10	1	8.8	2.6	13	<0.1	2.5	<0.1	4.8	0.96	<0.1	2	2.4	1.2	9	2.9	10	<0.1	2.8	<0.1	2.6	0.9	<0.1	1.6	1.6	4.8089	4.199

WW1-treated water from Canteen

WW2-treated water from HEMM area

HEMM area

* Parameters are within permissible norms

NT- Not traceable

SANJAYA KUMAR PATNAIK
General Manager(Env.)
Panchpatmali Bauxite Mine