



स्टील अथॉरिटी ऑफ इण्डिया लिमिटेड
STEEL AUTHORITY OF INDIA LIMITED
रॉ मटेरियल्स डिवीजन
RAW MATERIALS DIVISION
बोलानी अयस्क खदान
BOLANI ORES MINES

Ref No: - BOM/ENV/5.1/HD-2911

Date:-29/11/2017

To,

Additional Principal Chief Conservator of Forests (C),
Ministry of Environment, Forest and Climate Change,
Regional Office (EZ),
A/3, Chandersekharpur,
Bhubaneswar – 751023

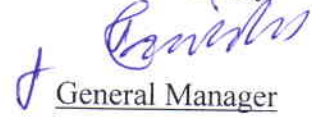
Sub: Six monthly status of compliance to the conditions stipulated in the Environmental Clearance granted by MoEFCC for 12 MTPA Iron Ore production from 5.10 sq. Miles ML vide letter no. J-11015/418/2008-IA.II(M) dated 21/12/2012 for the period ending 30th September, 2017.

Sir,

Please find enclosed herewith the Six monthly compliance report for the period APR'17-OCT'17 with respect to the conditions stipulated by GoI, MoEF, New Delhi, in the Environmental Clearance grant order of Bolani Ores Mines for the production of 12 MTPA Iron Ore from 5.10 sq Miles ML vide ministry's letter no. J-11015/418/2008-IA.II(M) dated 21/12/2012. The report also contains the updated status of the environmental monitoring reports pertaining to the above period.

Thank you,

Yours faithfully


General Manager

Bolani Ores Mines

महाप्रबंधक (खनन) / General Manager (Mines)
सेल - आर एम डी - बोलानी-अयस्क खदान
SAIL-RMD-Bolani Ores Mines
बोलानी-758 037, क्योन्नर, ओड़ीसा
Bolani-758 037, Keonjhar, Odisha

Encl: As above

Copy:

1. Director, IA Division, MoEF&CC, GOI, Indira Paryavaran Bhavan, Aliganj, Jor Bagh Road, New Delhi - 110 003.
2. In-charge, Eastern Zone, CPCB, Southern Conclave, Block 502, 5th & 6th Floors, 1582 Rajdanga Main Road, Kolkata - 700 107 (W. B.)
3. The Member Secretary, State Pollution Control Board, Paribesh Bhawan, A/118, Nilkantha Naga, Unit – VIII, Bhubaneshwar – 751 012, Odisha

स्टील अथॉरिटी ऑफ इण्डिया, लिमिटेड रॉ मटेरियल्स डिवीजन, बोलानी अयस्क खदान, पो- बोलानी - 758037, जिला - क्योन्नर, ओड़ीसा
Steel Authority of India Ltd., Raw Materials Division, Bolani Ores Mines, PO. : Bolani - 758037, Dist. Keonjhar, Odisha
दूरभाष / Telephone : 06767 - 260211 (O) फैक्स / Fax 06767 - 260172, Email : rmdbom@gmail.com, Website : www.sail.co.in

Six Monthly
COMPLIANCE REPORT
OF
ENVIRONMENTAL CLEARANCE CONDITIONS
(Grant Order no: J-11015/418/2008-IA.II(M) dated 21/12/2012)

OF
BOLANI ORES MINES (5.10 Sq Miles ML)
In Keonjhar District of Orissa

For the Period April'2017-September'2017



STEEL AUTHORITY OF INDIA LIMITED
RAW MATERIALS DIVISION
BOLANI ORES MINES
BOLANI- 758037

<u>Sl. No.</u>	<u>Condition</u>	<u>Compliance Status</u>
(i)	Environmental Clearance is subject to obtaining clearance under the Wildlife (Protection) Act, 1972 from the competent authority, as applicable.	Provision of Wildlife (Protection) ACT 1972 is not attracted to the Project as there are no Wildlife sanctuaries, National Parks or similar places specified in the Act within 10 KM radius of the project.
(ii)	The project proponent shall obtain Consent to establish from the State Pollution Control Board, Orissa and effectively implement all the conditions stipulated there in.	Consent to Establish for expansion of the mine to produce 12 MTPA was granted by Odisha State Pollution Control Board vide No. 23405 dated 21.12.2013. Conditions stipulated in the Consent to Establish are complied. Subsequently, Consent to Operate was granted vide letter No. 4784/IND-I-CON-242 Dt.18.03.2016 from Orissa State Pollution Control Board for the production of 12 MTPA of Iron Ore and is valid till Dt.31-03-2019.
(iii)	Forest Clearance for 73.20 ha of Safety Zone has not been obtained by the project proponent. This environmental clearance subject to the grant of forest clearance for diversion of 73.20 ha of safety zone within one year.	Forest Clearance for 73.12 ha of Safety Zone has been granted by MoEF & CC, vide F. No. 8-17/1997-FC(vol.) dt.12/11/14 . A copy of the same was enclosed with six monthly EC compliance report for the period Apr'14 to Sep'14 vide our letter No.BOM/ENV/HD-1401 Dt.14.01.2015.
(iv)	The Company shall submit within 3 months their policy towards Corporate Environment Responsibility which should inter- alia provide for (i) Standard operating process/ process to bring into focus any infringement/ deviation/ violation of the environmental or forest norms/ conditions, (ii) Hierarchical system or Administrative order of the company to deal with the environmental issues and for ensuring compliance with the EC conditions and (iii) System of reporting of non-compliances / violations of environmental norms to the Board of Directors of the company and / or shareholders or stakeholders.	The Policy towards Corporate Environmental Responsibility including details of set up was submitted to Ministry vide our letter no RMD/BOM/E&L/5.1sqMiles/EC/2013/91 dt.18-03-2013. SAIL has always been an environmentally conscious and responsible company. Way back in 1996, it was a pioneer in adopting a Corporate Environmental Policy. In view of the rapid technological advancements in the past two decades and growing stringency of regulatory requirements, SAIL has revised its Environmental Policy and made "Corporate Environmental Vision, Policy and Responsibility", which is under implementation and copy of the same had been attached in EC compliance report for the period of Oct'15 to Mar'16 submitted vide letter no. BOM/ENV/5.1/HD-3600 Dt.30.06.2016.

<u>Sl. No.</u>	<u>Condition</u>	<u>Compliance Status</u>
(vii)	The biological survey shall be repeated during October- December and mid-May month to see the existence of wildlife corridors, if any. Based on the same, necessary Wildlife Conservation Plan as may be required shall be prepared and implemented in consultation with the state Forest and Wildlife Department.	<p>Necessary biological surveys were conducted by expert committees and Wild Life Experts and based on the same, Site Specific Wildlife Conservation Plan has been prepared and approved by the state Forest and Wildlife Department vide order no 4506/1 WL(C)SSP-126/2012 Dt. 23.06.2014 with a total financial outlay of Rs.1676.41 lakhs, is implemented by Bolani Ores Mines, M/s SAIL.</p> <p>The Study revealed no Wildlife corridors within the Mining Lease area.</p>
(viii)	The biological survey shall also be undertaken to identify the trees with orchids, if any Such trees, so identified shall be protected and if need be, these trees may be relocated.	The contract procedures have been finalized and Work Order for carrying out the job of "Biological survey to identify the trees with orchids" will be awarded to PCCF (Wildlife) empanelled Party. The validity of empanelment certificate of the party has expired and the job shall be commenced immediately after the submission of the valid certificate. the detailed report of the survey shall be submitted for endorsement of MoEF&CC.
(ix)	The project proponent shall ensure that no natural water course and/or water resources shall be obstructed due to any mining operations.	No natural water course or water resources have been obstructed due to Mining operations within the Mining Lease Area.
(x)	The top soil, if any, shall temporarily be stored at earmarked site only and should not be kept unutilized for a period more than three years. The topsoil should be used for land reclamation and plantation.	The top soil excavated till date has been utilized for reclamation & rehabilitation of dumps. No top soil was excavated during Apr'17 to Sep'17 due to continuation of mining in already broken areas. Top soil generated in future during the expansion of the mine pits to virgin areas, if any, will be stored temporarily at earmarked site and will be used for plantation /dump reclamation.
(xi)	The Over Burden (OB) generated during the mining operation shall be stacked at earmarked dump sites(s) only and should not be kept active for long period. In critical areas, use of geo textiles shall be undertaken for stabilization of dump. Monitoring and management of rehabilitated areas should continue until the vegetation becomes self-sustaining. Compliance status should be submitted to the	<p>Over Burden (OB) generated from the mines is dumped at earmarked sites only; the details are as follows:</p> <p>(i) Over Burden (OB) generated from F-mining Area is dumped as backfilling inside the quarry in the southern part. Plantation of 15,000 trees has been undertaken on 4.0 heccts of this backfilled area.</p> <p>(ii) Over Burden (OB) generated from other mining Areas is dumped on the existing earmarked active OB dumps as per the Mining</p>

Sl. No.ConditionCompliance Status

	<p>roads, green belt development etc.. The drains should be regularly de-silted particularly after monsoon and maintained properly.</p> <p>Garland drain of appropriate size, gradient and length shall be constructed for both mine pit and sump capacity should 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 should also provide adequate settling of slit material. Sedimentation pits should be constructed at the corners of the garland drains and de-silted at regular intervals.</p>	<p>As per the scheme, Garland drains of 2030 meters have been constructed all along the OB dumps to prevent flow of runoff directly into the natural stream. 07 Nos. of sedimentation pits have been constructed at the corner of the garland drains to treat runoff water even during peak rainfall and they are de-silted regularly before and after monsoon.</p> <p>During Apr'17 to Sep'17 the following Jobs have been undertaken for mitigating silt generation from the Mines:</p> <ol style="list-style-type: none"> Boundary wall & inside garland drain has been provided at Garbage Stock Yard at a cost of Rs.14.10 lakhs A RCC retaining wall has been erected along the Karo Guest house approach Road at a cost of Rs.7.92 lakhs. RRM retaining wall has been provided at D-area of BOM at a cost of Rs.10.30 lakhs Sand bag check dam has been erected at tailing pond within 6.90 sq. miles ML of BOM at a cost of Rs.6.66 lakhs. Clearing eroded soil nearby huttings/basthi and Township of BOM at a cost of Rs.95,675. <p>Photograph of Garland drain, settling ponds along toewall and Sedimentation pit are attached as Annexure-VI. Water collected in settling ponds is reutilized for watering the plantation.</p>
(xiii)	<p>Dimension of retaining wall at the toe of dumps and OB benches within the mine to check run-off and siltation should be based on the rainfall data.</p>	<p>Dimensions of retaining walls at the toe of dumps and OB benches within the mine to check run-off and siltation are based on the rainfall data.</p> <p>The details of existing retaining walls around the OB dumps and stockpiles are attached as Annexure-II.</p>
(xiv)	<p>Plantation shall be raised in an area of 33.487 ha including a 7.5m wide green belt in the safety zone around the mining lease by planting the native species around OB dumps, reclaimed area, mine benches, along the roads etc. in consultation with the local DFO/ Agriculture Department. The density of the trees should be around 2500 plants per hectare. Greenbelt shall be developed all along the mine lease areas</p>	<p>Till September 2017, 2.45 lakh saplings have been planted within mines premises, to reclaim and rehabilitate an area of 96.7 ha, which includes the said 33.487 ha degraded forest land and 7.5m strip safety zone area, with average density of 2500 (approx.) plants per Hectare, within 5.10 sq. miles ML of BOM. The said area includes Safety Zone, OB dumps, Avenue Plantation and Degraded Forest lands. The cost of plantation amounts to Rs.514.00 lakhs.</p> <p>Proposal for plantation of 5000 saplings over 2 ha of Urban/semi-urban area is under processing.</p>

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	and winter (January); once in each season) shall be carried out in consultation with the State Ground Water Board / Central Ground Water Authority and the data thus collected may be sent regularly to Ministry of Environment and Forests and its Regional Office, Bhubaneswar, Central Ground Water Authority and Regional Director, Central Ground Water Board. If at any stage, it is observed that the groundwater table is getting depleted due to the mining activity; necessary corrective measures shall be carried out.	Apr'17-Sep'17 indicates no abnormalities or violations of the prescribed standards. The Ground Water Table levels for the period of Apr'17-Sep'17 are attached as Annexure-I(C) .
(xviii)	The project proponent shall obtain necessary prior permission of the competent authorities for drawl of requisite quantity of surface water, if any, required for the project.	Approval exists for extraction of the 7 cusec (for envisaged level of production) of surface water from Karo River and Jhikaria Nallah. Presently the Average consumption is well within the permitted quantity. Rainwater harvesting report of Bolani Ores Mines is under scrutiny by CGWB, Bhubaneshwar. Also, the Proposal for STP is under preparation by the CET, M/s SAIL, Ranchi
(xix)	The safeguard measures as suggested by the Central Ground Water Board vide letter No. 21-4(231)/CGWA/SER/2010-1010 dated 11.06.2010 shall be effectively implemented.	A copy of the said letter has been requested from MoEF New Delhi so that the contents of the above letter could be known for compliance, if any, by BOM. The conditions stipulated in above said order will be complied as applicable to BOM.
(xx)	The project proponent shall practice Suitable rain water harvesting measures on long term basis and work out detailed scheme rain water harvesting in consultation with Central Ground Water Authority and submit a copy of the same to the Ministry of Environment & Forests and its Regional Office, Bhubaneswar.	The report of "Technical Feasibility Study on Rain Water Harvesting & Preparation of Master Plan for Ground Water Recharges" prepared by the consultant is being submitted to CGWB Bhubaneswar for endorsement and approval of the same, after which the suggested long term measures will be implemented. Meanwhile, Bolani Ore Mines has undertaken following water harvesting measures as per prevailing guideline of CGWB for rainwater harvesting: (1) constructions of Masonry and RCC check dams across seasonal and perennial nallahs, (2) constructions of loose boulder check dams (LBCD) across seasonal streams / gully plugs (3) Digging of staggered trenches

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		<p>crusher.</p> <p>iii. Covering of conveyors from Hill top Hopper till dispatch point</p> <p>iv. Dry fog system at 600 tph plant.</p> <p>v. Fixed water sprinkling system covering a length of 200m near 600TPH Plant.</p> <p>Regular maintenance is undertaken for smooth operation of pollution control measures.</p>
(xxv)	Sewage treatment plant should be installed for the colony. ETP should also be provided for the workshop and wastewater generated during mining operation.	<p>Feasibility study report to establish STP at Bolani Ores Mines has been submitted to BOM by Civil Dept., IIT Kharagpur. Based on the report the proposal for outsourcing the construction of STP is under preparation by CET, M/s SAIL, Ranchi.</p> <p>Meanwhile, individual septic tanks followed by soaking pits have been provided in all quarters and office locations.</p> <p>3 nos. of ETPs (Oil and Grease catch traps) have been provided at mechanical workshops and equipment washing junctions to collect and treat workshop effluent.</p> <p>Following activities have been taken up during Apr'17 to Sep'17 for better handling of Effluent within BOM:</p> <p>i. Boundary wall & garland drain have been constructed around domestic garbage yard at a cost of Rs 14.10 lakhs.</p>
(xxvi)	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 should be drawn and followed accordingly.	<p>All newly appointed workers undergo a comprehensive medical examination (Pre-Employment Medical Examination) and subsequently a Periodical Medical Examination (PME) at regular intervals. All workers undergo a PME every 5 years; however workers whose age is >45 years the PME is done every 3 years. All contractual workers also undergo medical examination. The findings are maintained in each worker's individual medical record, valid throughout his duration of service. These records are manually maintained and computerized. A three tier health monitoring program is in vogue at Bolani Mines. The mine's hospital has an Occupational Health O.P.D. Centre, which is run by Occupational Health Physician. The mines' hospital is a 60 bedded multi-specialty hospital with facilities to handle major and minor surgeries and casualty department. A 4-bedded ICU and a blood bank are</p>

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	<p>whichever is closer shall be monitored periodically. Further, quality of discharged water shall also be monitored [TDS, DO, PH and Total Suspended Solids (TSS)]. The monitored data shall be uploaded on the website of the company as well as displayed on a display board at the project site at a suitable location near the main gate of the Company in public domain. The Circular No. J-20012/1/2006- IA.II(M) dated 27.05.2009 issued by Ministry of Environment and Forest, which is available on the website of the Ministry www.envfor.nic.in shall also be referred in this regard for the compliance.</p>	<p>reports. Monitoring Reports are enclosed as Annexure-I.</p> <p>There is no discharge from Mines in this lease. However the analysis report of TDS, DO, PH and Total Suspended Solids of 12 locations inclusive of the tailing pond seepage in the adjoining lease is regularly submitted in the compliance reports. The monitoring data are uploaded in the website of the company in the six monthly compliance reports and displayed near main gate in Public domain (easily accessible).</p>
(xxx)	<p>A final mine closure plan along with details of Corpus Fund should Be submitted to the Ministry of Environment & Forest 5 years in Advance of final mine closure for approval.</p>	<p>Final Mine Closure plan along with details of Corpus fund will be submitted to the Ministry 5 years in advance of final mine closure for approval. However the Progressive Mine Closure Plan (PMCP) is approved by IBM.</p>
(xxxi)	<p>No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forests and No change in the calendar plan including excavation, quantum of mineral iron ore and waste should be made.</p>	<p>There has been no change in mining method and scope of working as per the elaborations in the approved Mining Scheme / mining plan. Mining will be done as per the approved mining plan. Prior approval will be sought from Ministry of Environment, Forests and Climate Change to alter any mineral excavation process.</p>

Sl. No.**Condition****Compliance Status**

(xxxv)	Occupational health surveillance program of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed.	Occupational Health Survey is carried out regularly to assess the existing condition and to check the effectiveness of the management measures and to observe any contractions due to exposure to dust and take corrective measures. The findings are maintained in the worker's medical record maintained throughout the duration of his service. Medical tests are carried out at the Bolani Mine Hospital. A three tier health monitoring program is in vogue at Bolani Mines. In case of a person, who is found to be suffering from some work related disorder, he is treated accordingly at the mine's hospital or referred to SAIL's Hospital at Rourkela or to specialized hospitals elsewhere as per the requirement. If deemed necessary, the worker is reassigned elsewhere in the mine either temporarily or permanently. The course of action taken is recorded in the worker's medical file.
(xxxvi)	A separate environmental management cell with suitable qualified personnel should be set - up under the control of a Senior Executive, who will report directly to the Head of the Organization.	An Environment Management Cell (EMC) is established as a separate section under the Mines Department under direct control of Dy. General Manager (Mines). The details of constitution is as follows : <ol style="list-style-type: none">1. Assistant General Manager (Env & Lease)2. Junior Manager (Env & Lease)3. Foreman (Env & Lease) Assistant General Manager (Environment & Lease) co-ordinates the day to day activities pertaining to communications related to statutory clearances and compliances of Environment, Forest & Lease Renewal issues and reports to the Dy General Manager (Mining) and Mines Manager who being statutory head regularly reviews the compliances of various Stipulations, Acts and Regulations pertaining to Environmental Matters of Mines and reports to Head of Mines. One (1) Junior Manager (Environment & Lease) is posted in the EMC who expedites initiation of proposals as per Environmental Management Plan and co-ordinates field implementation jobs. A Mining Foreman (Environment & Lease) assists him in the day to day activities. Necessary measures are also being taken up for capacity building of the Environment Management Cell by appointment of required qualified personnel as planned in EMP Further, an Environmental Management System (EMS) has been implemented at Bolani Ore Mines

<u>Sl. No.</u>	<u>Condition</u>	<u>Compliance Status</u>
(xxxix)	A copy of clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parisad/ Municipal Corporation, Urban Local Body and the local NGO, if any, from whom suggestion/ representation has been received while processing the proposal. The clearance letter shall also be put on the website of the Company by the proponent, The State Pollution Control Board should display a copy of the clearance letter at the Regional Office, District Industry Center and Collector's office/ Tehsildar's office for 30 days.	Copies of clearance letter were given to local bodies from whom suggestion/ representation has been received while processing the proposal.
(xL)	The project authorities should advertise at least in two local newspapers of the District or State in which the project is located and 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 Boards and also at web site of the Ministry of Environment and Forests at http://envfor.nic.in and a copy of the same should be forwarded to the Regional Office of the this Ministry located Bhubaneswar.	<p>Advertisements regarding grant of environmental clearance was published in Odiya daily SAMBADA, Bhubaneswar & Sambalpur Edition on date 27-12-2012 and Business Standard on date 27-12-2012.</p> <p>A copy of the same has been deposited with the authorities at Regional Office of the MoEF, Bhubaneswar.</p>
7	The Ministry or any other competent authority may alter /modify the above conditions or stipulate any further condition in the interest of environment protection.	Agreed to. The conditions will be complied as and when stipulated.
8	Failure to comply with any of the condition mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.	Duly Noted.

Mitra S. K. Private Limited

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Ref. No.BBL/ENV/2017-18/116

Date: 01/09/2017

AMBIENT AIR QUALITY FOR MAY'17 TO JULY'17

LOCATION*	MONTH	PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO
Karo Guest House	May'17	89.40	44.40	5.08	24.32	0.44
	June'17	53.00	24.00	4.21	24.84	0.31
	July'17	55.25	29.25	5.13	23.45	0.25
General Office	May'17	81.00	39.67	4.50	22.67	0.38
	June'17	66.50	29.50	4.75	26.76	0.33
	July'17	51.50	26.00	5.70	24.55	0.29

*AAQ monitoring has been carried out in only 02 (two) Locations due to establishment of 04 nos. of CAAQMS stations at Bolani Ores Mines.

Checked by:-

For Mitra S. K. Private Limited

Authorised Signatory



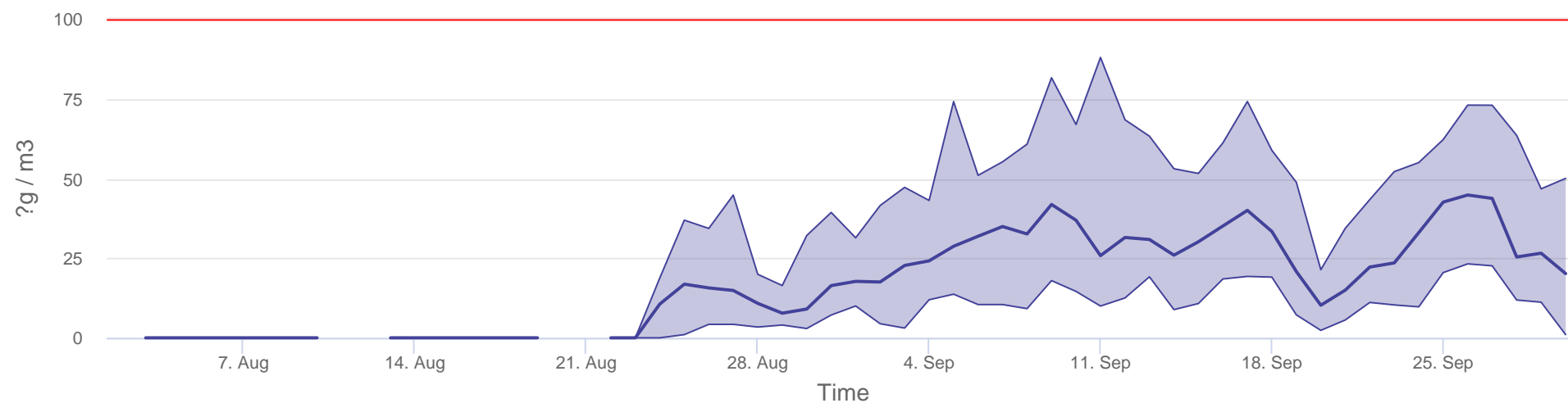
H. O.: Shrachi Centre (5th Floor), 74B, Acharya Jagadish Chandra Bose Road, Kolkata – 700 016, West Bengal, India
T: 91 33 22172249 / 4014 3000 / 2265 0006 / 2265 0007 F: 91 33 2265 0008 E: info@mitrask.com W: www.mitrask.com

SAIL RMD

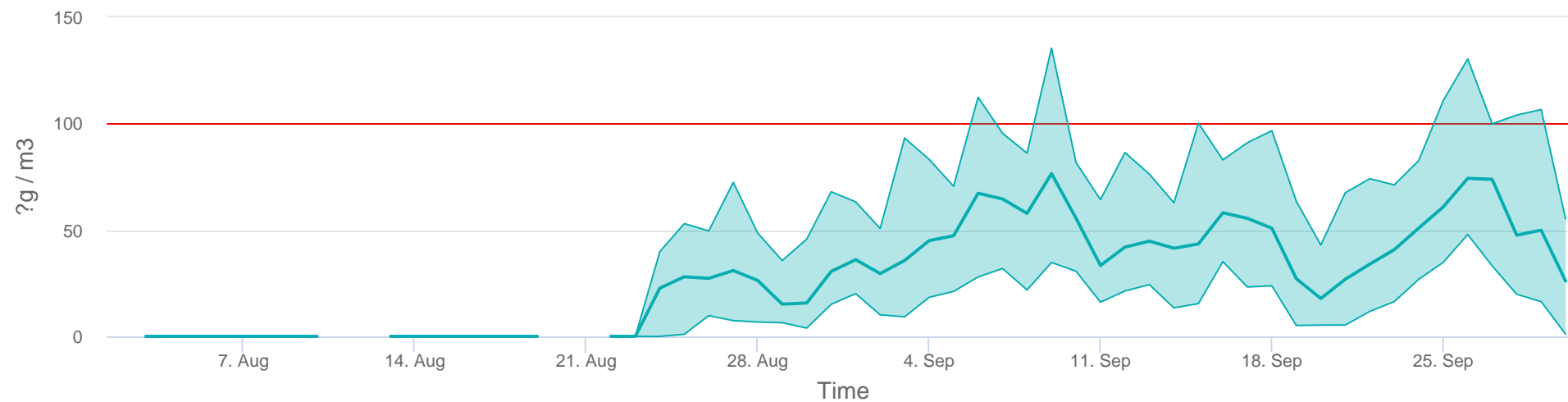
🕒 From: 00:00, 01-Aug-2017

🕒 Upto: 00:00, 30-Sep-2017

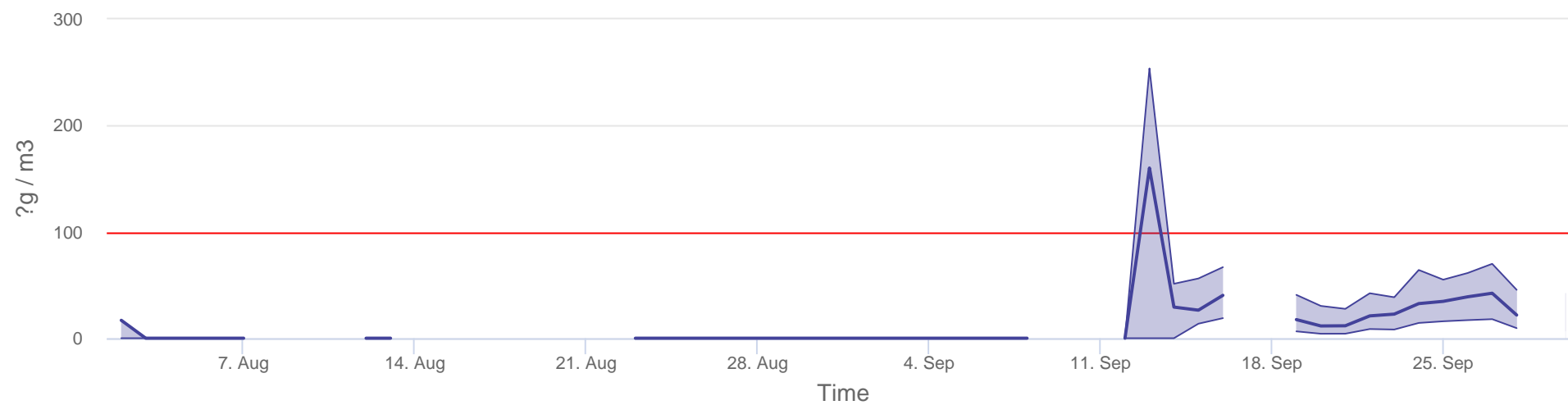
PM2.5 of CISF Colony



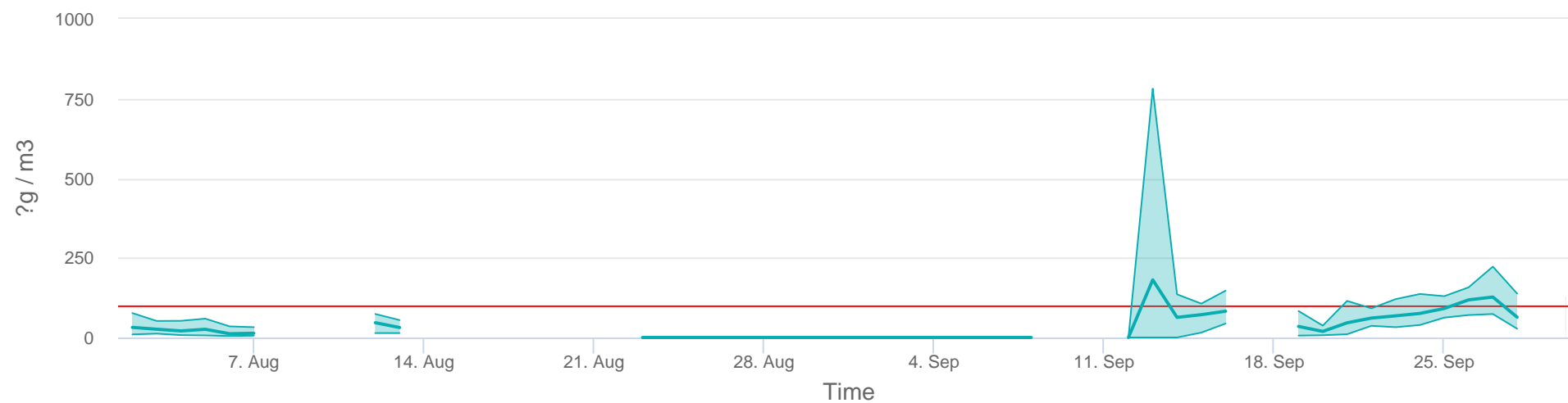
PM10 of CISF Colony



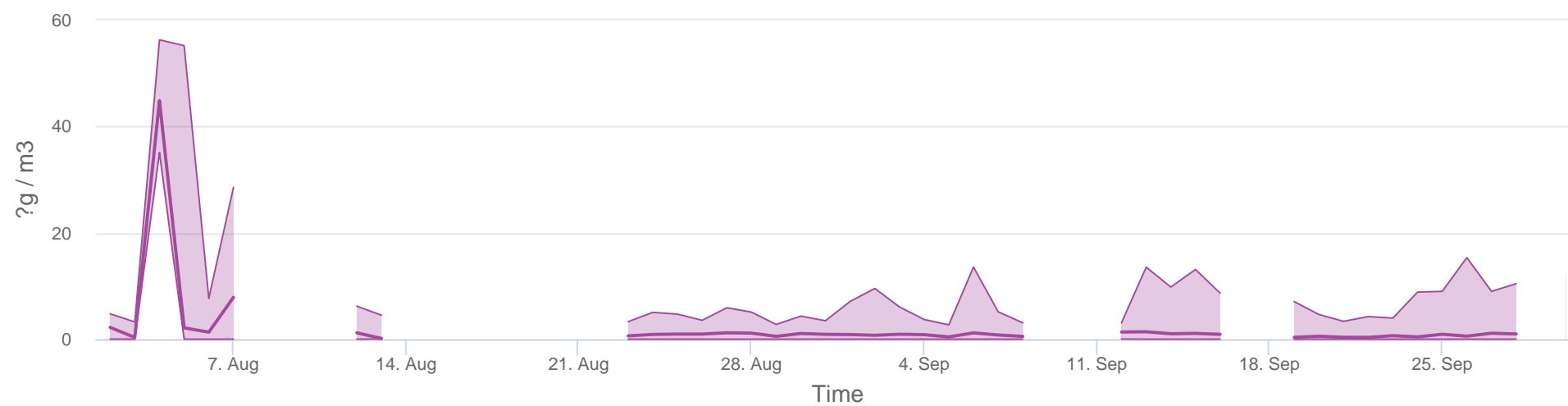
PM2.5 of Campus Store



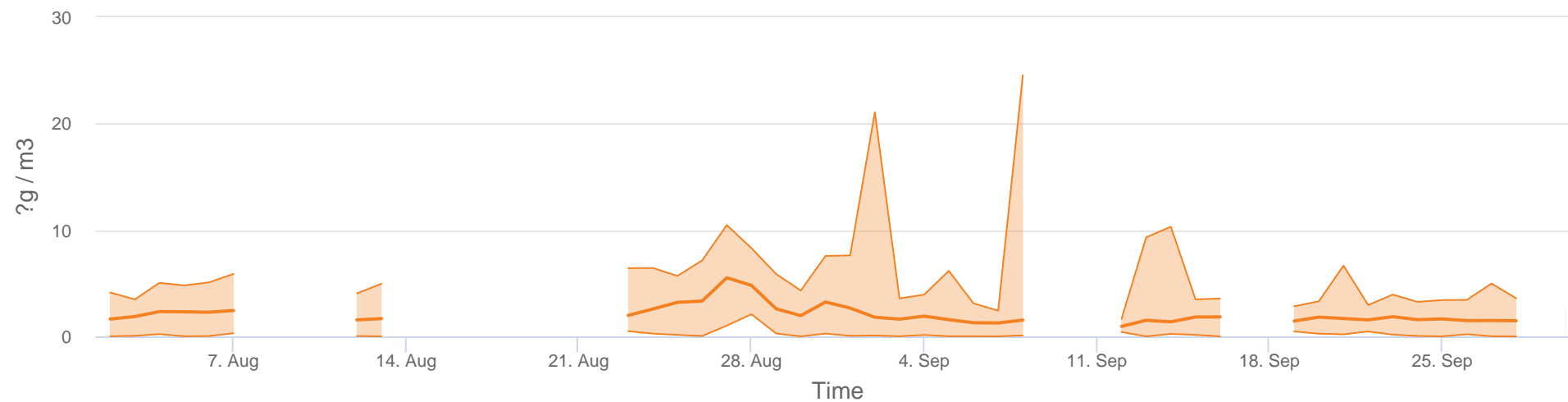
PM10 of Campus Store



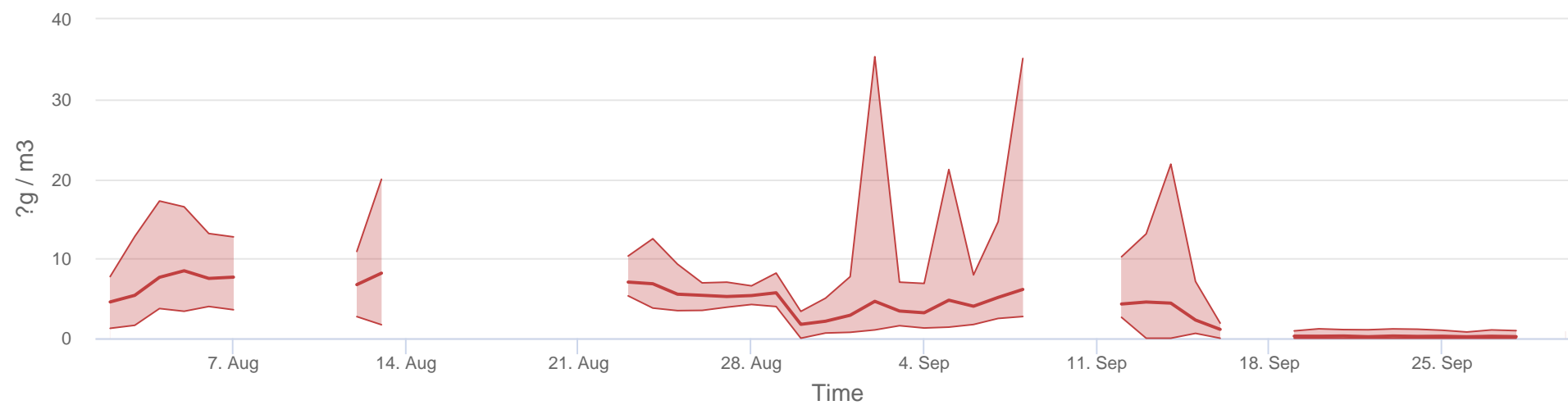
SO2 of Campus Store



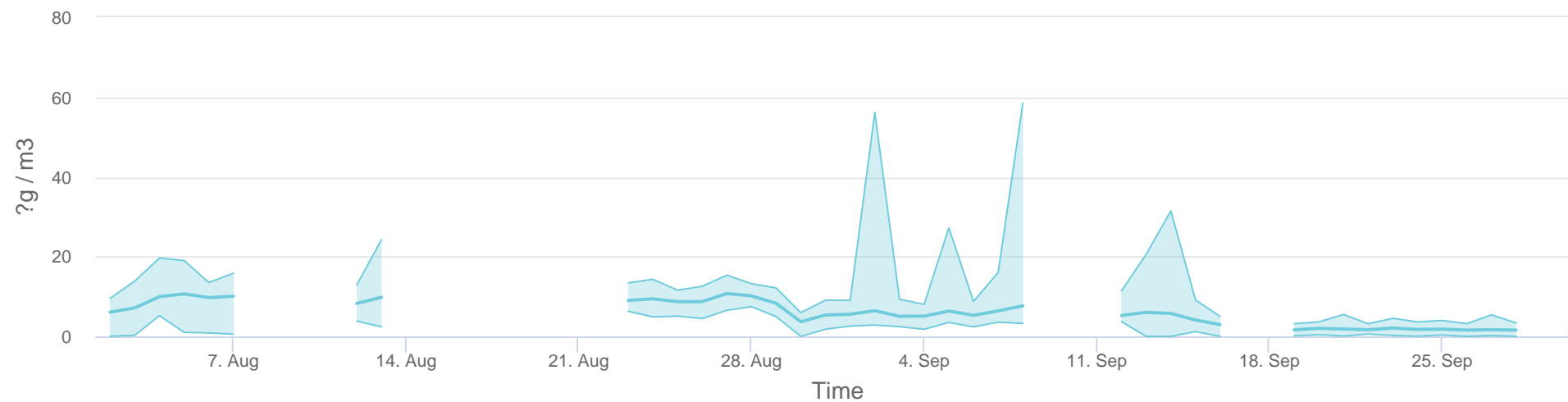
NO of Campus Store



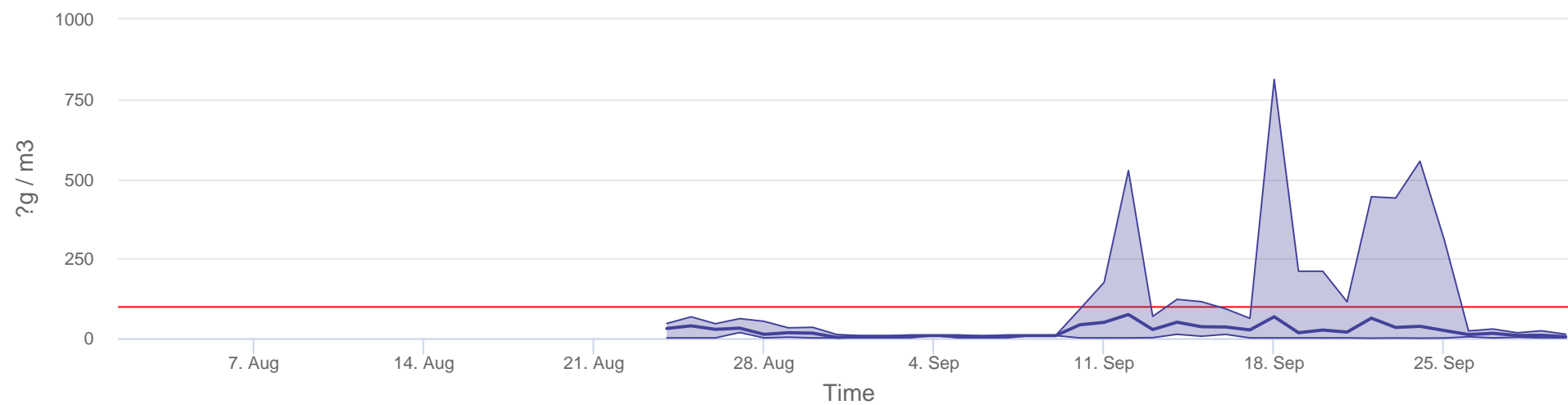
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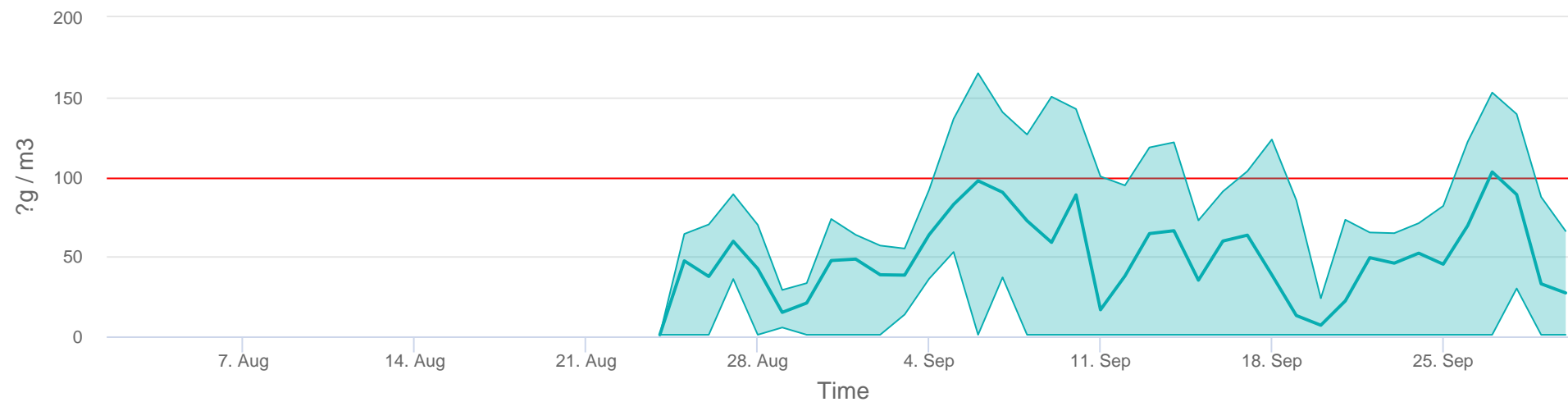
NOx of Campus Store



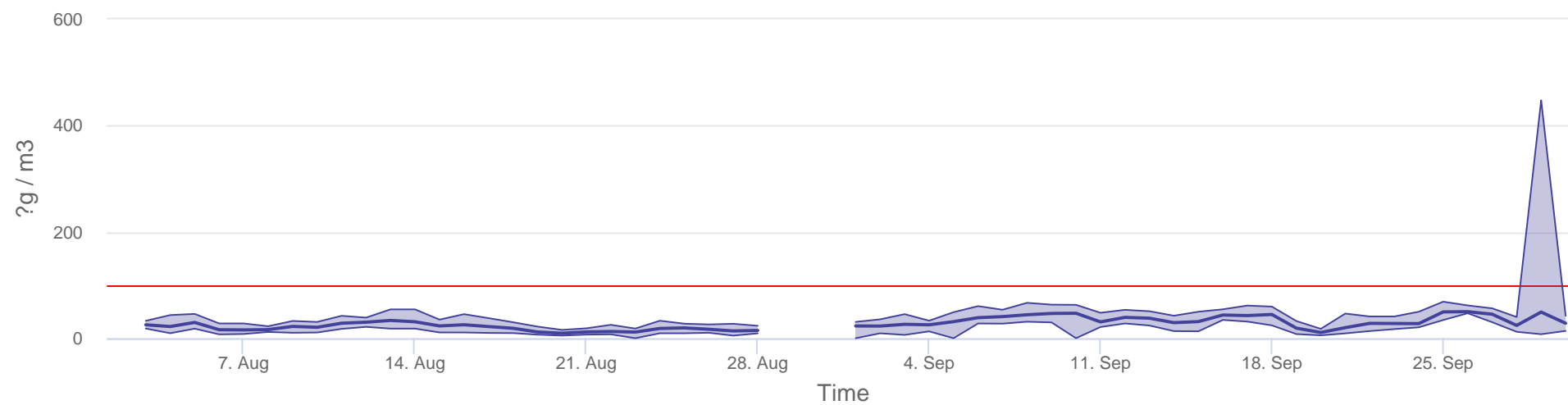
PM2.5 of JNRC



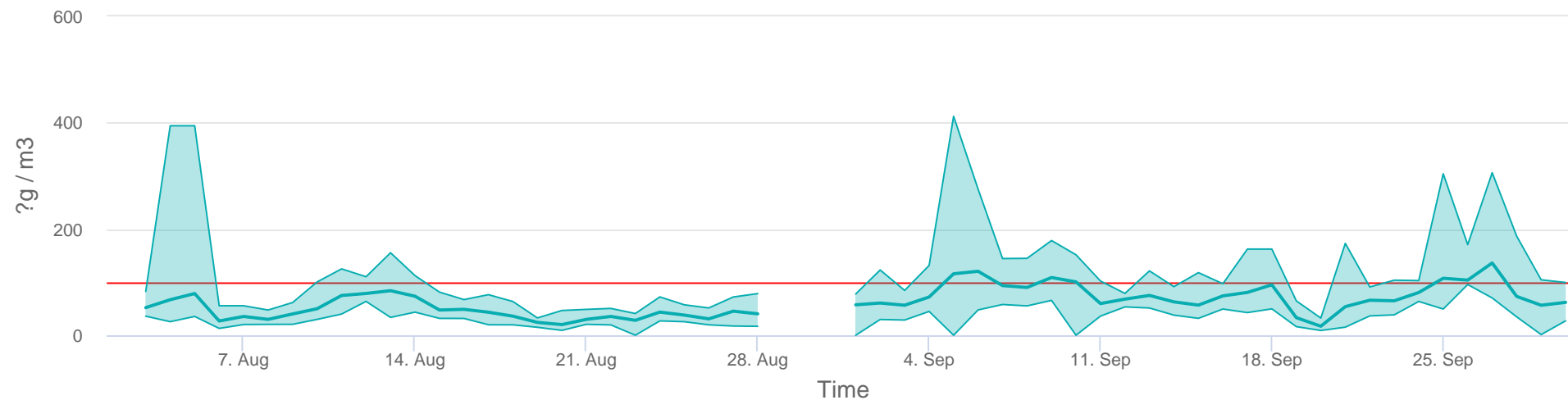
PM10 of JNRC



PM2.5 of Near Karo Bridge



PM10 of Near Karo Bridge



Date & Time	Station	PM _{2.5}			PM ₁₀			SO ₂			NO			NO ₂			NO _x		
hh:mm:ss dd-mm-yyyy		$\mu\text{g}/\text{m}^3$			$\mu\text{g}/\text{m}^3$			$\mu\text{g}/\text{m}^3$			$\mu\text{g}/\text{m}^3$			$\mu\text{g}/\text{m}^3$			$\mu\text{g}/\text{m}^3$		
		Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.
00:00, 01 to 00:00, 02-Aug-2017	CISF Colony	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	16.87	0	16.87	31.66	9.58	76.59	2.22	0.01	4.78	1.63	0.01	4.12	4.55	1.24	7.73	6.07	0.04	9.54
	JNRC	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 02 to 00:00, 03-Aug-2017	CISF Colony	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	0	0	0	25.93	12.01	51.86	0.33	0	3.24	1.86	0.05	3.48	5.38	1.62	12.77	7.14	0.27	13.87
	JNRC	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	25.26	18.21	32.71	51.96	35.86	82.33	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 03 to 00:00, 04-Aug-2017	CISF Colony	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	0	0	0	20.62	7.37	52.23	44.85	35.10	56.30	2.33	0.21	5.03	7.64	3.72	17.21	9.96	5.18	19.64
	JNRC	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	21.98	9.35	43.51	66.86	25.53	394.20	-	-	-	-	-	-	-	-	-	-	-	-

Date & Time	Station	PM _{2.5}			PM ₁₀			SO ₂			NO			NO ₂			NO _x		
00:00, 04 to 00:00, 05-Aug-2017	CISF Colony	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	0	0	0	25.70	6.50	59.10	2.13	0	55.19	2.31	0.01	4.79	8.46	3.38	16.48	10.65	1.01	19.01
	JNRC	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	29.68	17.96	45.73	78.48	35.37	394.20	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 05 to 00:00, 06-Aug-2017	CISF Colony	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	0	0	0	11.74	4.51	34.87	1.32	0	7.68	2.27	0.03	5.07	7.50	3.98	13.13	9.72	0.86	13.50
	JNRC	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	15.93	7.23	27.77	26.80	12.87	55.49	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 06 to 00:00, 07-Aug-2017	CISF Colony	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	0	0	0	13.26	5.62	32.30	7.87	0	28.56	2.43	0.29	5.87	7.66	3.57	12.71	10.06	0.55	15.83
	JNRC	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	15.62	7.93	27.77	35.35	20.18	55.49	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 07 to 00:00, 08-Aug-2017	CISF Colony	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	JNRC	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	16.16	11.74	22.51	29.86	20.50	47.47	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 08 to 00:00, 09-Aug-2017	CISF Colony	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	JNRC	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	22.21	10.26	32.44	40.07	20.54	61.54	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 09 to 00:00, 10-Aug-2017	CISF Colony	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	JNRC	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	20.56	10.72	30.59	49.88	29.82	100.30	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 10 to 00:00, 11-Aug-2017	CISF Colony	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	JNRC	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	28.20	17.56	42.14	74.81	39.88	124.90	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 11 to 00:00, 12-Aug-2017	CISF Colony	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	0	0	0	46.35	13.79	73.70	1.20	0	6.21	1.55	0.03	4.04	6.72	2.71	10.88	8.26	3.82	12.87
	JNRC	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	30.16	21.31	38.71	78.62	63.69	110.10	-	-	-	-	-	-	-	-	-	-	-	-

Date & Time	Station	PM _{2.5}			PM ₁₀			SO ₂			NO			NO ₂			NO _x		
00:00, 12 to 00:00, 13-Aug-2017	CISF Colony	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	0	0	0	31.20	13.79	54.56	0.14	0.03	4.51	1.67	0	4.95	8.16	1.69	19.94	9.80	2.38	24.24
	JNRC	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	33.45	18.05	54.26	83.83	33.55	155.20	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 13 to 00:00, 14-Aug-2017	CISF Colony	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	JNRC	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	30.92	18.07	54.26	73.42	43.47	112.20	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 14 to 00:00, 15-Aug-2017	CISF Colony	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	JNRC	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	23.11	10.84	35.00	47.48	31.73	81.13	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 15 to 00:00, 16-Aug-2017	CISF Colony	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	JNRC	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	25.34	10.79	45.25	48.75	31.63	67.07	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 16 to 00:00, 17-Aug-2017	CISF Colony	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	JNRC	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	21.95	9.94	37.81	43.33	19.74	76.35	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 17 to 00:00, 18-Aug-2017	CISF Colony	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	JNRC	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	18.69	9.62	30.07	35.92	19.62	63.43	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 18 to 00:00, 19-Aug-2017	CISF Colony	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	JNRC	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	11.75	6.69	21.92	24.19	14.97	32.57	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 19 to 00:00, 20-Aug-2017	CISF Colony	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	JNRC	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	9.37	4.91	15.67	20.07	9.20	46.58	-	-	-	-	-	-	-	-	-	-	-	-

Date & Time	Station	PM _{2.5}			PM ₁₀			SO ₂			NO			NO ₂			NO _x		
00:00, 20 to 00:00, 21-Aug-2017	CISF Colony	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	JNRC	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	11.88	6.77	18.62	29.86	20.56	48.68	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 21 to 00:00, 22-Aug-2017	CISF Colony	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	JNRC	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	12.64	7.29	25.20	35.40	19.46	50.48	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 22 to 00:00, 23-Aug-2017	CISF Colony	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	0	0	0	0	0	0	0.63	0	3.30	1.97	0.49	6.41	7.04	5.31	10.31	9.01	6.28	13.40
	JNRC	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	11.55	0	18.17	28.05	0	40.86	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 23 to 00:00, 24-Aug-2017	CISF Colony	10.61	0	18.82	22.68	0	39.80	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	0	0	0	0	0	0	0.89	0	5.04	2.57	0.26	6.43	6.83	3.78	12.48	9.41	4.89	14.31
	JNRC	30.59	1.00	46.22	1.00	1.00	1.00	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	18.39	9.29	32.89	43.54	26.99	72.13	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 24 to 00:00, 25-Aug-2017	CISF Colony	16.84	1.00	36.93	28.00	1.00	53.00	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	0	0	0	0	0	0	0.96	0	4.71	3.20	0.14	5.68	5.52	3.46	9.29	8.71	5.08	11.59
	JNRC	38.81	1.00	67.04	47.35	1.00	64.19	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	19.37	9.29	27.35	37.92	25.49	57.29	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 25 to 00:00, 26-Aug-2017	CISF Colony	15.66	4.23	34.33	27.28	9.76	49.58	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	0	0	0	0	0	0	0.96	0	3.55	3.32	0.03	7.14	5.38	3.49	6.94	8.71	4.46	12.55
	JNRC	27.78	1.00	45.43	37.52	1.00	70.14	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	16.79	10.25	25.93	30.86	19.60	51.35	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 26 to 00:00, 27-Aug-2017	CISF Colony	14.86	4.23	44.81	30.94	7.40	72.37	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	0	0	0	0	0	0	1.20	0	5.91	5.51	1.01	10.46	5.23	3.89	7.03	10.74	6.53	15.33
	JNRC	31.60	17.83	61.45	59.61	35.94	89.09	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	13.69	4.88	27.14	45.31	17.33	71.97	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 27 to 00:00, 28-Aug-2017	CISF Colony	10.82	3.38	19.94	26.28	6.77	48.52	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	0	0	0	0	0	0	1.14	0	5.09	4.79	2.08	8.29	5.35	4.23	6.57	10.15	7.44	13.21
	JNRC	12.08	1.00	53.00	42.38	1.00	69.89	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	14.64	9.15	23.36	40.31	16.81	78.35	-	-	-	-	-	-	-	-	-	-	-	-

Date & Time	Station	PM _{2.5}			PM ₁₀			SO ₂			NO			NO ₂			NO _x		
00:00, 28 to 00:00, 29-Aug-2017	CISF Colony	7.73	4.01	16.41	15.14	6.43	35.62	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	0	0	0	0	0	0	0.53	0	2.77	2.59	0.27	5.86	5.70	3.97	8.17	8.29	4.96	12.13
	JNRC	17.35	3.27	32.58	15.04	5.55	29.08	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 29 to 00:00, 30-Aug-2017	CISF Colony	9.03	2.92	32.10	15.69	3.90	45.71	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	0	0	0	0	0	0	1.07	0	4.34	1.95	0	4.31	1.74	0	3.36	3.67	0	5.96
	JNRC	15.84	1.00	34.22	20.92	1.00	33.35	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 30 to 00:00, 31-Aug-2017	CISF Colony	16.39	7.15	39.35	30.53	15.08	67.98	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	0	0	0	0	0	0	0.91	0	3.47	3.23	0.26	7.56	2.13	0.65	5.02	5.36	1.79	9.06
	JNRC	2.64	1.00	11.53	47.52	1.00	73.55	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 31-Aug to 00:00, 01-Sep-2017	CISF Colony	17.72	9.99	31.39	36.05	20.08	63.22	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	0	0	0	0	0	0	0.87	0	7.11	2.66	0.05	7.61	2.88	0.74	7.72	5.54	2.59	9.02
	JNRC	5.36	1.00	8.07	48.42	1.00	63.65	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	23.04	0	30.69	57.28	0	77.52	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 01 to 00:00, 02-Sep-2017	CISF Colony	17.52	4.42	41.53	29.52	10.12	50.69	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	0	0	0	0	0	0	0.73	0	9.54	1.80	0.08	21.07	4.63	1.04	35.31	6.44	2.83	56.15
	JNRC	5.03	1.00	8.07	38.61	1.00	56.91	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	22.84	9.24	35.54	60.61	29.67	122.80	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 02 to 00:00, 03-Sep-2017	CISF Colony	22.71	3.06	47.22	35.69	9.19	93.22	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	0	0	0	0	0	0	0.93	0	6.06	1.62	0.01	3.57	3.41	1.57	7.03	5.03	2.43	9.30
	JNRC	7.77	1.00	8.07	38.37	13.68	55.05	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	26.18	6.23	45.27	56.48	28.61	84.33	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 03 to 00:00, 04-Sep-2017	CISF Colony	24.16	11.95	43.11	45.01	18.35	83.18	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	0	0	0	0	0	0	0.85	0	3.70	1.90	0.13	3.92	3.19	1.28	6.87	5.08	1.77	8.03
	JNRC	8.07	8.07	8.07	63.69	36.10	91.90	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	25.20	12.86	32.99	71.94	44.80	131.30	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 04 to 00:00, 05-Sep-2017	CISF Colony	28.73	13.69	74.14	47.30	21.14	70.57	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	0	0	0	0	0	0	0.43	0	2.70	1.57	0.01	6.16	4.77	1.39	21.16	6.34	3.49	27.19
	JNRC	7.82	1.00	8.07	82.70	52.89	136.30	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	31.20	0	48.95	115.67	0	412.00	-	-	-	-	-	-	-	-	-	-	-	-

Date & Time	Station	PM _{2.5}			PM ₁₀			SO ₂			NO			NO ₂			NO _x		
00:00, 05 to 00:00, 06-Sep-2017	CISF Colony	31.88	10.44	50.99	67.26	27.90	112.40	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	0	0	0	0	0	0	1.18	0	13.57	1.28	0.01	3.10	4.01	1.72	7.94	5.28	2.38	8.76
	JNRC	4.86	1.00	8.07	97.50	1.00	164.90	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	38.65	27.73	60.37	120.38	47.62	275.00	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 06 to 00:00, 07-Sep-2017	CISF Colony	34.93	10.44	55.24	64.58	31.90	95.46	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	0	0	0	0	0	0	0.79	0	5.15	1.26	0	2.42	5.12	2.48	14.62	6.38	3.56	16.01
	JNRC	7.82	1.00	8.07	90.30	36.97	140.50	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	40.65	27.42	53.54	93.41	57.85	144.30	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 07 to 00:00, 08-Sep-2017	CISF Colony	32.60	9.16	60.78	57.82	21.84	86.09	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	0	0	0	0	0	0	0.52	0	3.07	1.53	0.09	24.56	6.12	2.72	35.09	7.66	3.23	58.48
	JNRC	8.07	8.07	8.07	72.46	1.00	126.50	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	44.13	31.02	66.59	89.94	55.20	144.70	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 08 to 00:00, 09-Sep-2017	CISF Colony	41.85	17.95	81.62	76.51	34.72	135.50	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	JNRC	8.07	8.07	8.07	58.89	1.00	150.20	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	46.59	29.72	63.11	108.62	65.61	178.20	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 09 to 00:00, 10-Sep-2017	CISF Colony	36.91	14.57	66.94	55.50	30.63	81.73	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	JNRC	42.17	1.00	91.13	88.69	1.00	142.50	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	46.97	0	62.77	100.40	0	151.40	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 10 to 00:00, 11-Sep-2017	CISF Colony	25.79	9.97	88.00	33.32	16.07	64.25	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	JNRC	49.79	1.00	175.10	16.66	1.00	100.20	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	30.69	21.02	47.83	59.59	36.01	102.00	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 11 to 00:00, 12-Sep-2017	CISF Colony	31.49	12.51	68.44	41.97	21.36	86.41	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	0	0	0	0	0	0	1.35	0.02	3.08	0.94	0.41	1.64	4.29	2.62	10.21	5.24	3.69	11.42
	JNRC	74.32	1.00	526.10	37.87	1.00	94.61	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	39.20	27.77	53.40	67.97	53.34	78.71	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 12 to 00:00, 13-Sep-2017	CISF Colony	30.86	19.14	63.28	44.75	24.30	76.21	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	160.10	0	253.80	180.89	0	780.90	1.39	0	13.54	1.51	0	9.31	4.54	0	13.09	6.02	0	20.56
	JNRC	27.13	1.73	68.39	64.42	1.00	118.40	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	37.64	23.87	50.72	74.92	51.27	121.10	-	-	-	-	-	-	-	-	-	-	-	-

Date & Time	Station	PM _{2.5}			PM ₁₀			SO ₂			NO			NO ₂			NO _x		
00:00, 13 to 00:00, 14-Sep-2017	CISF Colony	25.94	8.85	53.07	41.42	13.39	62.79	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	29.27	0	51.21	63.08	0	135.40	1.02	0	9.80	1.37	0.23	10.31	4.40	0	21.83	5.75	0	31.46
	JNRC	50.19	12.23	121.80	66.21	1.00	121.60	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	29.27	13.33	42.32	62.80	37.83	91.39	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 14 to 00:00, 15-Sep-2017	CISF Colony	30.15	10.76	51.59	43.45	15.39	100.20	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	26.37	13.65	56.19	71.55	15.33	106.20	1.09	0	13.11	1.82	0.14	3.48	2.28	0.61	7.12	4.10	1.19	9.12
	JNRC	36.03	6.20	114.60	35.21	1.00	72.67	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	31.27	12.98	49.83	56.69	31.80	117.80	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 15 to 00:00, 16-Sep-2017	CISF Colony	35.09	18.47	61.18	58.10	35.13	82.96	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	40.34	18.87	66.82	82.44	43.74	146.90	0.91	0	8.65	1.83	0	3.56	1.11	0	1.89	2.95	0	4.96
	JNRC	35.21	11.95	92.30	59.74	1.00	90.80	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	43.64	34.38	54.40	74.09	49.34	96.91	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 16 to 00:00, 17-Sep-2017	CISF Colony	40.00	19.27	74.18	55.46	23.21	91.02	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	JNRC	26.08	1.00	62.31	63.42	1.00	103.50	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	42.55	31.25	61.44	80.58	42.63	162.10	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 17 to 00:00, 18-Sep-2017	CISF Colony	33.39	19.05	58.84	50.85	23.76	96.66	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	JNRC	67.33	1.00	811.30	38.54	1.00	123.40	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	44.68	24.17	59.43	94.90	49.66	162.10	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 18 to 00:00, 19-Sep-2017	CISF Colony	20.80	7.21	48.82	27.09	5.11	63.49	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	17.53	6.44	40.78	34.75	5.97	83.02	0.35	0	7.07	1.44	0.46	2.83	0.26	0	0.92	1.64	0.13	3.18
	JNRC	17.27	1.00	210.00	13.05	1.00	85.31	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	18.95	7.79	32.34	33.09	16.18	64.61	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 19 to 00:00, 20-Sep-2017	CISF Colony	10.23	2.34	21.38	17.81	5.29	42.92	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	11.53	4.21	30.38	19.00	7.01	37.25	0.56	0	4.65	1.81	0.25	3.30	0.25	0	1.18	2.02	0.43	3.62
	JNRC	25.53	0.88	210.00	6.98	1.00	23.89	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	10.79	5.42	17.63	16.96	8.98	32.30	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 20 to 00:00, 21-Sep-2017	CISF Colony	14.97	5.60	34.38	26.86	5.33	67.53	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	11.69	4.24	27.62	46.03	10.11	114.80	0.35	0	3.36	1.68	0.19	6.65	0.28	0	1.08	1.85	0.09	5.50
	JNRC	19.19	1.00	114.20	22.22	1.00	73.08	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	19.89	9.09	46.36	53.83	15.19	172.80	-	-	-	-	-	-	-	-	-	-	-	-

Date & Time	Station	PM _{2.5}			PM ₁₀			SO ₂			NO			NO ₂			NO _x		
00:00, 21 to 00:00, 22-Sep-2017	CISF Colony	22.21	11.10	43.38	33.96	11.73	74.09	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	21.00	8.63	42.30	60.89	36.58	91.33	0.34	0	4.25	1.55	0.46	2.95	0.19	0	1.06	1.66	0.58	3.16
	JNRC	62.92	0.02	443.60	49.31	1.00	65.11	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	27.95	13.43	40.90	65.91	36.41	90.84	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 22 to 00:00, 23-Sep-2017	CISF Colony	23.51	10.32	52.16	40.77	16.34	71.20	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	22.67	8.17	38.53	67.92	32.24	120.40	0.66	0	3.97	1.85	0.16	3.93	0.28	0	1.17	2.10	0.23	4.52
	JNRC	33.77	0.69	439.70	45.88	1.00	64.67	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	27.69	17.11	40.90	64.84	38.36	103.60	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 23 to 00:00, 24-Sep-2017	CISF Colony	33.01	9.72	55.00	50.90	26.84	82.62	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	32.55	14.36	64.19	75.50	39.17	136.50	0.43	0	8.85	1.57	0.04	3.24	0.23	0	1.13	1.73	0.04	3.62
	JNRC	37.34	0.05	554.90	52.14	1.00	70.93	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	27.46	20.50	49.80	80.42	63.59	102.90	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 24 to 00:00, 25-Sep-2017	CISF Colony	42.60	20.47	62.23	60.86	34.79	110.80	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	34.68	15.92	55.08	90.96	62.33	129.60	0.93	0	8.99	1.64	0	3.41	0.25	0	1.00	1.82	0.36	3.98
	JNRC	24.16	0.58	308.40	45.22	1.00	81.73	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	49.48	34.22	68.69	107.20	49.36	303.90	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 25 to 00:00, 26-Sep-2017	CISF Colony	44.82	23.21	73.03	74.28	47.87	130.40	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	38.96	17.01	61.35	118.00	70.30	157.20	0.57	0	15.34	1.48	0.20	3.43	0.18	0	0.78	1.57	0	3.19
	JNRC	11.42	4.32	22.73	69.44	1.00	122.00	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	49.95	46.98	61.70	103.79	95.41	170.50	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 26 to 00:00, 27-Sep-2017	CISF Colony	43.76	22.60	73.00	73.81	33.11	99.92	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	42.32	17.92	69.98	126.87	73.64	222.40	1.12	0	8.99	1.49	0.01	4.97	0.25	0	1.04	1.68	0.20	5.40
	JNRC	15.36	1.00	28.92	103.04	1.00	152.80	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	45.14	30.10	56.18	136.03	70.18	305.80	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 27 to 00:00, 28-Sep-2017	CISF Colony	25.37	11.86	63.53	47.57	19.81	104.00	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	21.78	9.46	45.50	63.63	27.35	137.70	0.98	0	10.44	1.47	0	3.58	0.20	0	0.95	1.57	0.01	3.35
	JNRC	8.54	2.94	17.09	88.88	30.03	139.30	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	24.06	12.05	39.88	73.11	34.62	186.50	-	-	-	-	-	-	-	-	-	-	-	-
00:00, 28 to 00:00, 29-Sep-2017	CISF Colony	26.56	11.18	46.76	49.90	16.34	106.60	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	JNRC	9.19	1.00	23.21	32.93	1.00	87.35	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	49.21	7.50	447.50	56.44	1.25	104.30	-	-	-	-	-	-	-	-	-	-	-	-

Date & Time	Station	PM _{2.5}			PM ₁₀			SO ₂			NO			NO ₂			NO _x		
00:00, 29 to 00:00, 30- Sep-2017	CISF Colony	20.15	1.00	50.03	25.99	1.00	55.17	-	-	-	-	-	-	-	-	-	-	-	-
	Campus Store	19.47	6.60	42.38	56.28	23.60	128.40	1.43	0	12.16	1.50	0.06	2.74	0.14	0	0.87	1.51	0.11	3.40
	JNRC	4.68	1.00	12.64	27.23	1.00	65.99	-	-	-	-	-	-	-	-	-	-	-	-
	Near Karo Bridge	28.13	13.72	42.26	61.89	27.10	99.27	-	-	-	-	-	-	-	-	-	-	-	-

Report generated by Phoenix Robotix Pvt. Ltd. at 18:29 - 29/Nov/2017 IST

Mitra S. K. Private Limited

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Dist. Keonjhar, Odisha - 753045
CIN U51309WB1955PTC023057

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Client Name: Steel Authority of India Limited, Site : Bolani Ores Mines Dist. Keonjhar Odisha
Ref. No. BBL/ENV/2017-18/117

Sl	LOCATION	TYPE	Date	Month	Year	pH	Cu	F	FRC	Fe	Mn	C6H5OH	Cd	CN	Pb	Hg	Ni	As	Zn	Cr+6	TSS	BOD	COD	O&G	S	NN
1	Tailing pond natural nallah	WATER	24-06-2017	JUNE	2017	6.52	<0.02	0.32	<0.1	0.09	<0.02	<0.001	<0.001	<0.01	<0.005	<0.001	<0.02	<0.01	<0.02	<0.01	24	2.2	8	<1.4	<0.1	<0.1
2	Catch pit water	WATER	24-06-2017	JUNE	2017	7.15	<0.02	0.1	<0.1	1.8	<0.02	<0.001	<0.001	<0.01	<0.005	<0.001	<0.02	<0.01	<0.02	<0.01	34	2.8	12	<1.4	<0.1	0.73
3	Karo river at kalimandir	WATER	22-06-2017	JUNE	2017	7.27	<0.02	0.14	<0.1	0.95	<0.02	<0.001	<0.001	<0.01	<0.005	<0.001	<0.02	<0.01	<0.02	<0.01	21	<2.0	8	<1.4	<0.1	0.28
4	Jhikiria nalla before karo	WATER	21-06-2017	JUNE	2017	6.67	<0.02	<0.1	<0.1	1.7	<0.02	<0.001	<0.001	<0.01	<0.005	<0.001	<0.02	<0.01	<0.02	<0.01	8	<2.0	<4.0	<1.4	<0.1	<0.1
5	Jhikiria nalla After karo	WATER	22-06-2017	JUNE	2017	6.77	<0.02	<0.1	<0.1	0.78	<0.02	<0.001	<0.001	<0.01	<0.005	<0.001	<0.02	<0.01	<0.02	<0.01	14	<2.0	<4.0	<1.4	<0.1	0.15
6	Well at bolani basti	WATER	22-06-2017	JUNE	2017	6.72	<0.02	<0.1	<0.1	0.29	<0.02	<0.001	<0.001	<0.01	<0.005	<0.001	<0.02	<0.01	<0.02	<0.01	9	<2.0	<4.0	<1.4	<0.1	0.92
7	Well at balagoda	WATER	22-06-2017	JUNE	2017	6.46	<0.02	<0.1	<0.1	0.17	<0.02	<0.001	<0.001	<0.01	<0.005	<0.001	<0.02	<0.01	<0.02	<0.01	<2.5	<2.0	8	<1.4	<0.1	0.48
8	Panposh nalla	WATER	20-06-2017	JUNE	2017	6.89	<0.02	<0.1	<0.1	2	<0.02	<0.001	<0.001	<0.01	<0.005	<0.001	<0.02	<0.01	<0.02	<0.01	6	<2.0	31	<1.4	<0.1	0.43
9	MCGH tap water	WATER	20-06-2017	JUNE	2017	6.78	<0.02	<0.1	<0.1	<0.05	<0.02	<0.001	<0.001	<0.01	<0.005	<0.001	<0.02	<0.01	<0.02	<0.01	<2.5	4.7	8	<1.4	<0.1	<0.1
10	Karo near lease boundary	WATER	21-06-2017	JUNE	2017	7.3	<0.02	0.39	<0.1	0.39	<0.02	<0.001	<0.001	<0.01	<0.005	<0.001	<0.02	<0.01	<0.02	<0.01	9	<2.0	<4.0	<1.4	<0.1	0.47
11	KGH	WATER	21-06-2017	JUNE	2017	6.13	<0.02	<0.1	<0.1	0.11	<0.02	<0.001	<0.001	<0.01	<0.005	<0.001	<0.02	<0.01	<0.02	<0.01	<2.5	<2.0	<4.0	<1.4	<0.1	<0.1
12	Tailing pond seepage water	WATER	20-06-2017	JUNE	2017	6.87	<0.02	<0.1	<0.1	0.62	<0.02	<0.001	<0.001	<0.01	<0.005	<0.001	<0.02	<0.01	<0.02	<0.01	30	<2.0	<4.0	<1.4	<0.1	1.3

Checked by:-

For Mitra S. K. Private Limited

Authorised Signatory

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NOISE MONITORING REPORT**PERIOD OF MONITORING : Apr'17 - Sep'17**

Sl No	Location	Noise Level 1 hr Leq in dB(A)
A	AMBIENT NOISE LEVEL	
1	Bolani Township	60.5
2	Karo Guest House	61.2
B	WORK ZONE NOISE LEVEL	
1	F- Area Mine Pit	71.2
2	G-Area Mine pit	73.5
3	Panposh Quarry	66.8
4	D-Area Mine Pit	69.8
5*	Near Feed Hopper , F-area	76.4
6*	Secondary Crusher room	79.6
7*	Washing Plant	80.1
8	Loading Plant	73.6
9*	Inside operator's Cabin Drill Machine(in running condition)	82.1
10*	Inside operator's Cabin of running Dumper with Load	80.8
11*	Inside engine Testing Room during Engine Testing	85.2

*Noise Exposure less than - 8 hours

Annexure-II:Particularsof existing Retaining walls

Sl No	Location	Particulars of construction	Dimension (L X B X H) (m)
1	Toe wall around Old OB dump of F-area (D1)	Dry boulder toe wall	L= 200 m, H= 1.5 m, Top width= 1.2pm, Bottom width=1.5m
2	Toe wall around Panposh quarry near Magazine area (D4)	Masonry Retaining wall	L= 180 m, H= 1.5 m, Top width= 0.8m, Bottom width=1.5m
3	Toe wall around OB dump of D-area (D8)	Cemented Retaining wall followed by Garland drain	L= 700 m H= 1.5 m Top width= 1.0 m Bottom width=1.5 m
4	Toe wall around OB dump of G-area (D5)	Dry boulder toe wall followed by Garland drain	L= 450 m H= 1.5 m Top width= 1.0 m Bottom width=1.5 m
5	Toe wall around Fines dump at DH5 Valley (D2)	Masonry Retaining wall followed by Garland drain	L= 250 m H= 1.5 m Top width= 1.0 m Bottom width=1.5 m
6	Toe wall around Old Fines dump near 600 TPH Plant (D3)	Dry Boulder Retaining wall followed by Garland drain	L= 200 m H= 1.5 m Top width= 1.0 m Bottom width=1.5 m
7	Retaining Toe wall Panposh OB Dumps	RCC retaining wall	L= 450 m, H= 2.0 m Top width= 1.5 m Bottom width=2.0 m
8	Retaining Toe wall Panposh Quarry including Dumps	Dry Boulder Retaining wall followed by garland drain	L= 750m, H= 1.5 m Top width= 1.3 m Bottom width=1.8 m
9	Retaining Toe wall around Fines Dumps	Masonry Retaining wall	L= 450m, H= 1.5 m Top width= 1.3 m Bottom width=1.8 m
10	Retaining Wall behind DH-5 and Old fines dump near 600TPH	RRM retaining wall	L= 450m, H= 1.5 m Top width= 1.0 m Bottom width=1.5 m
11	Retaining Boundary wall	Cemented wall	L= 2500m, H= 2.0m width= 10 in
12	Retaining Wall along the broken area and waste dump at G-Area	Dry Boulder Retaining Wall	L= 815m, H= 1.5m Top width= 1.5 m Bottom width=2.0 m
13	Retaining wall near Primary Stockpile	Dry Boulder Retaining Wall	L= 10m, H= 0.75m, width= 2m
14	Retaining wall near New Fines Stockpile	RCC retaining wall	L= 35m, H= 3.0m, width= 0.35m
15	Extension of retaining wall near Panposh area	Dry Boulder Retaining Wall	L= 48m, H= 0.6m, Top width= 0.6 m Bottom width=0.8 m
16	Retaining wall of D-area OB dump	RRM retaining wall	L= 295m, H= 1.5 m Top width= 1.0 m Bottom width=1.5 m

Annexure-IV
PHOTOGRAPHS SHOWING MITIGATION MEASURES FOR CONTROL OF
RESPIRABLE SUSPENDED PARTICULATE MATTERS (RSPM)



Photograph showing Covered conveyors from feed hopper at Hill top



Imagery showing Covered conveyors from feed hopper at Hill top till Despatch Point



Photograph showing Bag House installed at secondary Crushing Point



Photograph showing High Pressure Dust suppression installed at Feed Hopper at Hill Top Plant



Photograph showing Wet Drilling



Photograph showing Water sprinkling on Haul Road by 28 KL BEML Water Sprinkler

Annexure-V OB-DUMP RECLAMATION AND REHABILITATION



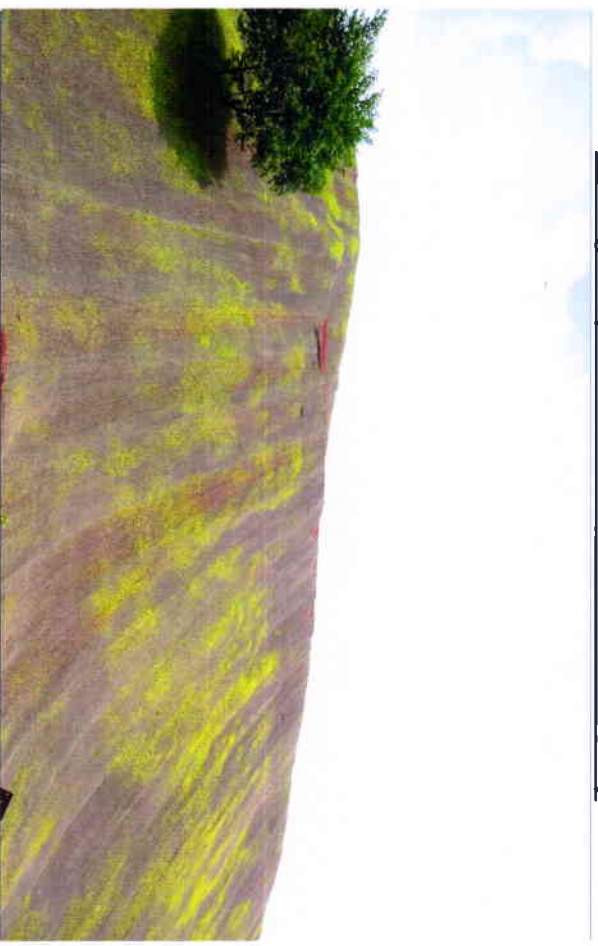
Vetiver Plantation on Old fines dump



Plantation of Drought hardy species on D-area OB dump



Native grass species broadcasted on D-area OB dump



Coir Matting on DH-5 subgrade dump

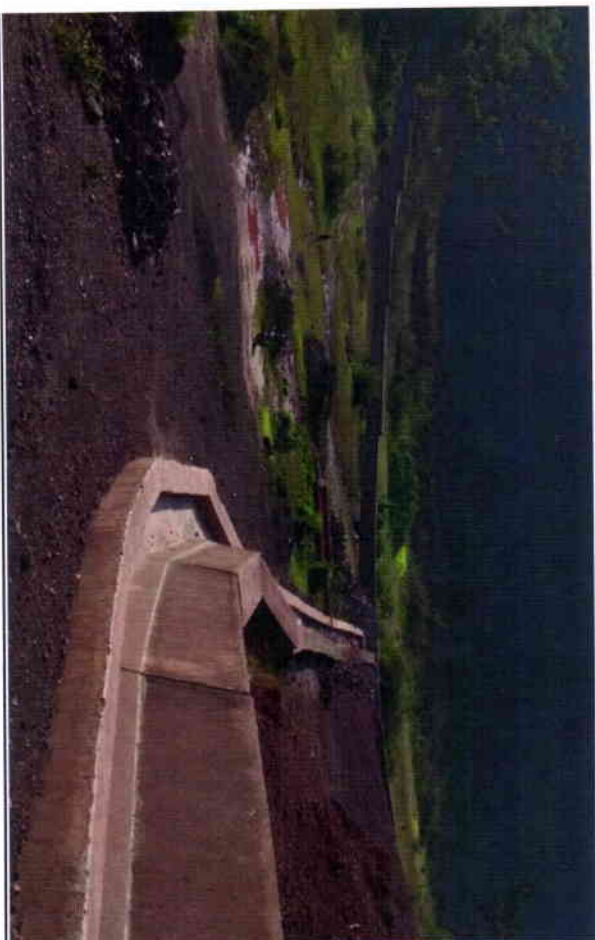
Annexure-VI RETAINING WALLS, GARLAND DRAINS, SETTLING PITs and SETTling PONDs



Settling Pit with Garland Drain surrounding DH-5 Dump.



Compound wall with garland drain around Domestic Garbage yard 2017-18



Retaining Wall with Garland Drain around Panposh OB Dump



Retaining wall around D-area OB dump 2017-18

Annexure-VII PLANTATION WITHIN 5.10 SQ. MILES ML



Plantation of 8000 saplings in 2017-18



In-house Nursery Developed at BOM,



Plantation of Drought hardy species over 20 ha degraded Forest Land



Native Sal Regeneration over 40ha of Degraded land near D-area



Water vats provided in plantation sites



Plantation in Safety Zone



Plantation near Panposh Entry Road

Annexure-VIII RAINWATER HARVESTING MEASURES WITHIN 5.10 SQ. MILES ML



Sandbag Checkdam near Tailing Pond to prevent flow Turbid water.



Contour bunds created to trap rainwater for harvesting.



Trenches dug near G-Area for Rainwater Harvesting



LCBDs across seasonal nalla



LBRW to retain runoff and replenish groundwater



Gully plugs installed at various junctures to arrest rainwater



LCBDs at Eco-Restoration site catering partially to watering requirements for the plantation in site