



स्टील अथॉरिटी ऑफ इण्डिया लिमिटेड
STEEL AUTHORITY OF INDIA LIMITED
रॉ मेटिरियल्स डिवीजन
RAW MATERIALS DIVISION
गुआ अयस्क खान
GUA ORE MINES

Ref. No. : GUA/E&L/Duarg.-EC Compl/18-19/058

Date: 24.05.2018

To,

The Addl. PCCF (C)

Ministry of Environment, Forest and Climate Change

Regional Office (ECZ)

Bungalow No. A - 2, Shyamali Colony

Doranda, Ranchi - 834 002

Sub: Compliance Report of Environmental Clearance accorded by MoEF&CC to the project : Integrated Duarguiburu Iron Ore Mining, Beneficiation and Pelletisation Project of SAIL, located in Ghatkuri Reserve Forest, Tehsil Gua, West Singhbhum Dist., Jharkhand [Ministry's Environment Clearance Letter No. J-11015/453/2008-IA.II(M) dated 25.03.2013]

Sir,

As per the provisions of the condition no. (x) of above stated Environmental Clearance order granted to the Integrated Duarguiburu Iron Ore Mining Project, the six monthly compliance report on the conditions stipulated in the Environmental Clearance for the period from *October, 2017 to March, 2018* is enclosed herewith for kind perusal please.

Thanking you.

Yours sincerely,

General Manager (Mines)

Gua Ore Mines

संयोजक (खान) गुआ

सेल, गुआ अयस्क खान
General Manager (Mines), Gua
SAIL, RMD, GUA ORE MINES

Encl: As stated above

Copy to:

1. Director, IA, MoEF&CC, GOI, Indira Paryavaran Bhavan, Aliganj, Jor Bagh Road, New Delhi - 110 003.
2. Member Secretary, JSPCB, HEC, Dhurwa, Ranchi - 834 004.
3. In-charge, Eastern Zone, CPCB, Southern Conclave, Block 502, 5th & 6th Floors, 1582 Rajdanga Main Road, Kolkata - 700 107 (W. B.)
4. The Regional Office, JSPCB, Jamshedpur

Compliances for conditions of Environmental Clearance (vide order no. J-11015/453/2008-I.A.II (M), dt.25.03.2013 & No. J-11015/453/2008-IA.II (M), dt.02.02.2015) of Duargaburu Iron Ore Mining Lease of Gua Ore Mines, Steel Authority of India Ltd.

(Period: October, 2017 – March, 2018)

S.No.	CONDITION	COMPLIANCES
<u>Specific Conditions:</u>		
(i)	No mining activities will be allowed in forest area for which the Forest Clearance is not available.	Mining operations are being carried out in the existing broken area of 274.691 ha, for which Forestry Clearance is available.
(ii)	The project proponent will seek and obtain approval under the FC Act, 1980 for diversion of the entire forest land located within the mining lease within a period of two years from 01.02.2013 i.e. the date of issue of guidelines by FC vide their letter F No. 11-362/2012-FC, failing which the mining lease area will be deduced to the non-forest area plus the forest area for which the project proponent has been able to obtain the FC at the end of this time period. In the case of reduction in mine lease area, the project proponent will need to get a revised mining plan approved from the competent authority for reduced area and enter into a new mining lease as per reduced lease area. The EC will be construed to be available for the mining lease area as per the revised mining lease deed.	MoEF&CC guideline vide F. No. 11-362/2012-FC, dated 01.02.2013 has been suppressed with a new guideline vide F.No.11-599/2014-FC, dated 01.04.2015 which is being complied with.
(iii)	Need to submit a proposal for faster utilization of entire dumps of fines within a period of one year. The new condition is stated as:	Request made to MoEF&CC on 24.03.2014 that the proposal for faster utilization of the fines from the fines dump shall be submitted later once the beneficiation & Pellet Plant are commissioned.



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	"The Project Proponent informed the Committee that the Plan envisages faster utilization of the fines from the fines dump by increasing operating hours of the fines beneficiation unit gradually from 5000 hrs. to 6200 hrs. per annum within a span of 3 years, which will increase the rate of reclamation of fines from the fine dump from 2.50 MTPA to 3.1 MTPA and by reducing the mined out beneficiated ore feed to the beneficiation plant in order to increase reclaimed & beneficiated fines from the fines dump to the tune of 0.5 MTPA from 4th year onwards. The complete consumption of fines from the fine dump shall take about 9 years' time instead of 13 years envisaged earlier. The Committee accepted the Plan and recommended for utilization of fines as proposed by M/s SAIL within 9 years instead of 13-14 years. During this period, all pollution mitigation measures at the dump site shall be implemented and augmented with additional measures on the basis of any Specific Studies conducted through Reputed Institutions to prevent/ minimize environmental impacts from the Fines Dumps. Detailed Action Plans in regard to Faster Reclamation of fines after Beneficiation and Pellet are commissioned and stabilized and Revised Proposal for faster liquidation of the fines (as is proposed now) may be submitted to the Regional Office of the Ministry, as also periodic Progress Reports."	• The matter discussed at the 25th EAC meeting held on 13.11.2014 and the EAC directed to submit the plan for faster utilization of the fines. • Accordingly, the proposal for faster utilization of fines from the fines dump at Gua Ore Mines has been submitted to the MoEF & CC on 14th November, 2014. Now the condition has been amended vide MOEF&CC Letter No. J-11015/453/2008-IA.II(M), dt.02.02.2015.
General Conditions:		
(i)	The project proponent shall obtain Consent to Establish and Consent to operate from the Jharkhand State Pollution Control Board and effectively implement all the conditions stipulated therein.	Consent to Establish was granted by Jharkhand State Pollution Control Board (JSPCB), Ranchi vide letter No. G- 1299, dated 06.04.2013. Consent to Operate has been renewed by JSPCB for the period from 01.01.2017 to 31.12.2020 vide Ref No. JSPCB/HO/RNC/CTO-1005380/2016/1066, dated 26.12.2016. Conditions stipulated in the CTE & CTO have been complied and compliance report submitted to Jharkhand State Pollution Control Board.

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(ii)	Environmental clearance is subject to final order of the Hon'ble Supreme Court of India In the matter of Goa Foundation Vs. Union of India in Writ petition (Civil) No. 460 of 2004, as may be applicable to this project.	Noted for compliance.
(iii)	Environmental clearance is subject to obtaining clearance under the Wildlife (Protection) Act,1972 from the competent authority, as may be applicable to this project	The condition is not applicable as there is no designated wildlife protected area/wildlife sanctuary within 10 Km radius to the project site.
(iv)	Coordinated efforts shall be made along with other operating mines in the area and action plan drawn for control of pollution load in the area. The action plan so prepared shall be effectively implemented. The air and water quality shall be monitored by involving the State Pollution Control Board and results submitted within 6 months.	Pollution control & prevention measures existed at the mines have been augmented and additional pollution prevention & control measures as envisaged under EIA / EMP study are being implemented at the mines. Based on study commissioned by IIT KGP, measures have also been implemented at the mines for effective environmental management in the area. Some of these include: • Settling Pits for eroded soil and earthen and concrete check dams have been constructed on the basis of the recommendations in the report. • The bank of the Zero Point Nalla has been planted with vetiver to provide stability to the slope. • Boulder Retaining walls at the foot of waste dumps and check dams to check the flow of fines during monsoons. • Bunds along the haul roads and outer periphery of the pits to ensure that no sediment laden storm water get discharged from the mined out area Coordinated efforts are ensured in preparation of Catchment Area Treatment (CAT) Plan covering entire Saranda Forest Division which is finalized by IIT KGP to control surface runoff from the mines as well as protection of Koina and Karo River system. Appropriate actions suggested in the report are under implementation. Latest environmental quality report

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		generated by JSPCB is placed in Annexure – 1 . To control the fugitive dust emissions from the screening & loading areas, the dust suppression system at screening plant have been revamped by replacing the nozzles. The permanent road sprinklers at the mines as well as township are operated on regular basis for dust suppression.
(v)	The Forest Right Act shall be implemented.	The Clearance required under Forest Rights Act, 2006 has already been obtained and necessary certificate has been issued by the Collector, Singhbhum (West) vide order no. 1277 A/88, dt.23.05.2011.
(vi)	The mining operations shall be 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 Forest and the Central Ground Water Authority shall be obtained, for which a detailed hydrogeological study shall be carried out.	The Ground Water Table in the Lease area is from 394 - 400 m AMSL whereas the present working depth and ultimate pit depth at the mines are 695m AMSL and 550m AMSL respectively. So there will be no intersecting of ground water table during mining operations at the mine.
(vii)	The project proponent shall ensure that no natural watercourse and/or water resources shall be obstructed due to any mining operation s. The first order streams and the seasonal nallahs originating from the mining lease area shall be protected.	There is no significant natural water course originating / present in the mining lease. In case any natural flow is encountered, due precautions will be taken to ensure that no natural watercourse / water resources obstructed due to any mining operations.
(viii)	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.	At present, no top soil is encountered as we are operating the mine within the existing broken area (274.691ha) since the start of mining operations in the lease area. However, whenever top soil is encountered in future while working in virgin areas, the top soil will be removed & stacked separately and will be used for reclamation and rehabilitation purpose. We will strictly adhere to instructions of CPCB & SPCB, MoEF&CC and IBM guidelines for top soil management as envisaged in mining plan/scheme and EIA/EMP Report.



S.No.	CONDITION	COMPLIANCES
(ix)	The over burden generated during the mining operation shall be stacked at car marked dump site(s) only and it should not be kept active for a long period of time and its phase-wise stabilization shall be carried out. There shall be four external over burden dumps. Proper terracing of the OB dumps shall be carried out so that the overall slope of the dump shall be maintained to 28 degree centigrade. The over burden dump shall be scientifically vegetated with suitable native species to prevent erosion and surface run off. In critical areas, use of geo textiles shall be undertaken for stabilization of the dump. Monitoring and management of rehabilitated areas shall continue until the vegetation becomes self-sustaining.	There are two active dumps, one at Ranichua turning and one started recently at northern sides of OT Hill, which are being maintained by appropriate grading and benching/top terracing maintaining less than 28° slope. Other old dumps are scientifically reclaimed and native species are planted to stabilize the dump as per suggestion of local forest department. The photographs are enclosed as Annexure-2 .
(x)	Compliance status shall be submitted to the Ministry of Environment & Forests and its Regional Office located at Bhubaneswar on six monthly basis.	Six monthly Compliance Status of EC conditions are being submitted to the Ministry of Environment, Forest & Climate Change and its Regional Office located at Ranchi regularly.
(xi)	Catch drains and siltation ponds of appropriate size shall be constructed around the mine working, mineral and over burden dumps to prevent run off of water and flow of sediments directly into the Karo River, the Koina River, the Sarako River and other water bodies. The water so collected should 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, mineral and over burden dumps to prevent run off of water and flow of sediment directly into the Karo River, the Koina River, the Sarako River and other water bodies and sump capacity should be designed keeping 50% safety margin over and above peak sudden rain fall (based on 50 years data) and maximum discharge in the area adjoining the mine site. Sump capacity should also provide	Based on a study conducted through IIT Kharagpur for identifying places vulnerable to erosion, checking surface runoff and other mitigative measures recommended have been undertaken such as provision of garland drains, settling pits and check dams of appropriate size have been constructed. Boulder/Retention wall has been constructed at the foot of Waste Dump at OT Hill and Ranichua. Provision of additional boulder wall at the foot of Ranichua Waste Dump is in progress. Water harvested through water storage pits constructed in mines is utilized for sprinkling on haul roads and green belt development. The settling pits / sedimentation pits and check dams are de-silted periodically prior to onset of monsoons and post monsoons to provide enough retention capacity. The photographs are enclosed as Annexure-3 .

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	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.	
(xii)	Dimension of the retaining wall at the toe of the over burden dumps and the OB benches within the mine to check run-off and siltation shall be based on the rain fall data.	Based on the study carried out through IIT KGP, mitigative measures recommended are based on rainfall data of past 50 years. While designing the retaining walls for OB Dumps, maximum rainfall measured at the site as well as erosion potential of dumped material is taken into consideration.
(xiii)	The water recovery & spill way system shall be so designed that the natural water resources are not affected & that no spill water goes into the nearby Karo River, Koina River, Sarako River & other bodies.	Gua Ore Mines has dry operations i.e. there is no facility of washing/beneficiation, hence no industrial effluent is generated and discharged. Besides this, measures have been taken to prevent water pollution of Karo River flowing across the township. Some of these include: • Settling Pits for eroded soil and earthen and concrete check dams have been constructed. • The bank of the Zero Point Nalla has been planted with vetiver to provide stability to the slope. • Boulder Retaining walls at the foot of waste dumps and check dams to check the flow of fines during monsoons. • Bunds along the haul roads and outer periphery of the pits to ensure that no sediment laden storm water get discharged from the mined out area.
(xiv)	The project proponent shall carry out conditioning of the ore with the water to mitigate fugitive dust emission, without affecting flow of ore in the ore processing & handling areas.	Provision of water mist spraying at hopper and screening areas at the Ore Crushing Plant has been provided for dust suppression and to prevent fugitive dust emission in the downstream ore processing and handling areas. The photographs are enclosed as Annexure-4 .
(xv)	The effluent from the ore beneficiation plant & pelletization plant shall be treated to conform to the prescribed standards & tailings slurry shall	Necessary provisions in respect of the same have been made in the proposed expansion project comprising of ore beneficiation plant &

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	be transported through a closed pipeline to the tailing dam.	pelletization plant at Gua Ore Mines.
(xvi)	The tailing dam shall be lined on all the sides as well as in the bottom with thick HDPE lining.	At present, there is no Tailing Dam. Provision of tailing dams has been envisaged in the proposed expansion project comprising of ore beneficiation plant & pelletization plant. All the stipulated conditions related to the Tailing Ponds shall be complied with the project.
(xvii)	The project proponent shall take necessary safeguard measures to ensure that there is no leaching from the tailing pond.	
(xviii)	The decanted water from the tailing pond shall be re-circulated & there should be zero discharge from tailing ponds.	
(xix)	Appropriate technology shall be used for maximum recovery of ore in order to reduce slurry discharge & to increase the life of the tailing dam.	
(xx)	The project proponent shall constitute an emergency management team under the control of project in charge to deal with the emergency situation pertaining to the tailing dam for the timely & effective control of emergency situation. It shall be ensured that training programme & mock drill shall be organized for the employees.	
(xxi)	Plantation shall be raised in an area of 469.838 ha including a 7.5 m wide green belt in the safety zone around the mining lease, over burden dumps, around beneficiation plant, mine benches, around tailing ponds, pelletization plant, roads etc. by planting the native species in consultation with local DFO/ Agriculture Department. The density of the trees should be around 2500 trees per ha.	Gua Ore Mines is highly dedicated to plantation activities in and around the mining leases of Gua Ore Mines. Since 1984-85 Gua Ore Mines has planted approx. 12.5 lakh saplings covering an area of 755 ha in and around all the four leases i.e. Duarguiburu, Jhillingburu-I, Jhillingburu-II and Toplailore. The plantation activity has been carried out in consultation with local Forest Department. Out of the safety zone area of 19.61 ha all along the 7.5 m strip, about 92 % of the safety zone is virgin dense forest. The remaining 8% of the safety zone area is being regenerated with the original & existing forest species as per suggestion of local Forest Department. During 2017-18, 3000 saplings of native species like Mango, Karanj,

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		Sheesham, Neem, Gulmohar etc. have been planted in mines and townships. Besides this 50 Kg seeds of native species have also been sown in the mines slopes and slopes of dams. Distribution of 500 nos. of fruit plant saplings to nearby villagers was carried out on the occasion of Environment Day on 5th June 2017. The photographs of plantation activity carried out are given as Annexure-5. In addition to this plantation activity is always carried out during events such as MEMC Week, Safety Week and World Environment Day etc for increasing awareness among the employees and locals.
(xxii)	The green belt shall be developed all around the mine lease within the initial 3 years from issue of clearance.	Out of the safety zone area of 19.61 ha all along the 7.5 m strip, about 92 % of the safety zone is virgin dense forest. The remaining 8% of the safety zone area is being regenerated with the original & existing forest species as per suggestion of local Forest Department.
(xxiii)	Effective safeguard measures such as regular water sprinkling shall be carried out in critical areas prone to air pollution & having high levels of particulate matter such as around crushing & screening Plant, loading, and unloading point and transfer points. Extensive water sprinkling shall be carried out on haul roads. It should be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control board in this regard.	High pressure Water Sprinklers (28 KL) have been deployed for regular water sprinkling on Haul Roads and other dust prone areas. In addition to this, permanent sprinklers have been installed along the main approach haul roads at crushing plant and other critical areas. Spray nozzles have also been provided at the hopper as well as screening & transfer points at Ore Processing Plant. Dry Fogging system has been installed at critical locations. Dust extraction system has been provided covering primary crushing & screening areas. As per the monitoring and analysis of Ambient Air quality, PM ₁₀ ranges from 30.8- 78.5 µg/m ³ , PM _{2.5} ranges from 15.5-45.2 µg/m ³ , SO ₂ ranges from 6.5-15.2 µg/m ³ and NO ₂ ranges from 6.4-16.4 µg/m ³ , the detailed report is enclosed as Annexure-6 . The photographs of air pollution control measures are enclosed as Annexure-4 .
(xxiv)	Regular monitoring of the flow rate of the springs & perennial nallas flowing in and around the mine lease shall be carried out & records	There are no perennial nallahs and springs in the vicinity or passing through the mining lease area. Only seasonal nallahs flow during the rainy season

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	maintained.	and since Gua Ore Mines operates on dry process, there is no interruption or addition of effluent in these seasonal natural flows.
(xxv)	The project authority should implement suitable conservation measures to augment the ground water resource in the area in consultation with Regional Director, Central Ground Water Board.	A comprehensive Remote Sensing & GIS based survey has been carried for Environment Management at Gua Ore Mines through the expertise services of IIT Kharagpur who has prepared a Digital Elevation Model (DEM) and drainage pattern & slope information from satellite imagery. Hydrologically area shows dendritic drainage pattern that looks like a branch of tree with dense connectivity of first and second order drainages. Study area follows first to sixth ordered streams in Gua mines region. As per drainage pattern of the mining lease area and watershed, the rain water from the mining lease drains towards western side into catchment of Koina River and accordingly to arrest flow of sediments during rainy season and to maintain zero discharge from working mines, settling pits have been developed at OT Hill Area (Capacity -2100 m³), 2nd Level Area (Capacity-120000 m³), Bai Hill and HD Buru Area (Capacity-75000 m³). Storm Water is directed towards these pits by developing bunds and garland drains. The retention capacity of the pits and the nature of soil allow the water to percolate and thus helps in augmenting the ground water resource. The collected water is also used for other allied purpose such as water sprinkling and plantation in mines. Thus these measures help in conserving water at Gua Ore Mines. The photographs of the rain water conservation pits are enclosed as Annexure-3.
(xxvi)	Regular monitoring of ground water level & quality shall be carried out in & around the project area (Mine lease, beneficiation plant, pelletization plant & tailing ponds) by establishing a network of existing wells & installing new piezometers during the operation. The periodic monitoring [(At least 4 times in a year- pre monsoon (April-May),	Ground Water Study is being carried out through in-house study for each quarter. Four open wells have been selected all around the Gua Ore Mines viz, (i) Guasai – Forest Bungalow, (ii) Ghatkuri Village, (iii) Chhota Nagra/ Baihatu Village & (iv) Baraiburu Near Pool, for regular monitoring of ground water levels & quality. The ground water levels and quality for the

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	monsoon (August), post monsoon (November) & Winter (January), once in each season)] shall be carried out in consultation with State Ground Water Board/ Central Ground Water Authority & data thus collected may be sent regularly to the Ministry of Environment & Forest and its regional office, Bhubaneswar, The Central Ground Water Authority & the Regional Director, Central Ground Water Board. If at any stage, it is observed that the ground water table is getting depleted due to Mining activity, necessary corrective measures shall be carried out.	period of October, 2017 to March, 2018 are given in the Annexure – 7 .
(xxvii)	The ground water & surface water in & around the Mines including the tailing ponds shall be regularly monitored at strategic location for heavy metals. The monitoring station shall be established in consultation with The Regional director, Central Ground Water Board & the State Pollution control board.	Noted for compliance. We are taking help of CGWB & JSPCB as directed for helping in identifying location of strategic locations.
(xxviii)	Appropriate mitigative measures shall be taken to prevent pollution of the Karo River, Koina River & the Sarako River in consultation with the State Pollution Control Board.	Detailed study has been conducted through IIT Kharagpur for identifying places vulnerable to erosion and suggesting mitigative measures to minimize soil erosion and control surface runoff from the mines. Most of the recommendations made by IIT KGP in the report like provision of silt traps, check dams, settling pits / sedimentation ponds, plantation on the slopes have been made at various strategic locations and the same are under continuous implementation at other sites.
(xxix)	Vehicular emission shall be kept under control & regularly monitored. Measures shall be taken for maintenance of vehicle used in mining operation & in transportation of Minerals. The vehicle shall be covered with a tarpaulin & shall not be overloaded.	Transport of iron ore is being carried out through dumpers from mine face to ore crushing plant using haul roads inside leasehold area. All these vehicles are being maintained in good condition to control vehicular emissions. Ore transportation from Ore Crushing Plant to other units is being done through covered conveyors.
(xxx)	No Blasting shall be carried out after the sunset. Blasting operation	Blasting operation is carried out during the day time only. To control

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	shall, be carried out during the day time. Control Blasting shall be practiced. The mitigative measures for control of ground vibration & to arrest fly rocks & boulders should be implemented.	ground vibration, Non Electric Detonator with suitable delays is being used.
(xxxix)	Drills shall either be operated with dust extractors or equipped with water injection system.	All the Drilling Machines at the mines are equipped with the dust extractors / wet drilling facility to control dust from the drilling operations.
(xxxixii)	Digital processing of entire lease area using remote sensing technique should be done regularly once in three year for monitoring land use pattern & report shall be submitted to the Ministry of Environment & Forest and its Regional Office located at Bhubaneswar.	The land use land cover of entire Duargaburu Mining Lease alongwith 10 km radius around the mining lease was studied using Remote Sensing and GIS by IIT Kharagpur in 2012. The images were captured by unsupervised classification and object based classification called hybrid classification technique with the reference of NRSA level-1 land use/land cover (LULC) classification. The LULC map was produced using this satellite imagery data. The significant observation included mine area (working boundary) to be 154.32 Ha out of the approved land use of 179.648 Ha. Similarly, digital processing of specifically Duargaburu Mining Lease area using remote sensing technique for land use pattern was carried out in 2015. The mine area (working boundary) was found to be 158.60 ha, thereby an increase of 2.8% approximately. The maps showing land use land cover pattern for the years 2012 and 2015 are enclosed as Annexure-8. The LULC study for the year 2018 is in progress through IIT (ISM), Dhanbad.
(xxxixiii)	Mineral handling area shall be provided with adequate no of high efficiency Dust Extractor System. Loading & unloading areas including all the transfer points should also have efficient dust control arrangements. This should be properly maintained & operated.	Dust Extractor system has been installed at Ore Processing Plant. In addition to this, sprinklers are used for Dust suppression at transfer points, screening areas and loading areas. Dry Fogging System is in place at ore unloading area of Ore Processing Plant. All these units are being maintained and operated on regular basis. The photographs of these facilities are enclosed as Annexure-4 .

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(xxxiv)	Sewage treatment plant shall be installed for the colony. ETP shall also be provided for the workshop and the generated during mining operation.	Septic Tanks followed by soaking pits have been provided for the quarters in cluster. Also, major domestic drains of Gua Township and Market area have been streamlined and converged into a single drain followed by 02 nos. of settling pits to provide enough retention time for the domestic effluent to settle down and oxidize the water. A proposal for composite study alongwith designing, installation and maintenance of Sewage Treatment Plant covering the township and market of Gua Ore Mines has been initiated for early compliance. Installation of oil and grease trap along with vehicle washing ramp, maintenance bay and covered storage yard for proper handling of hazardous waste for the workshop effluents has been provided which is operated and maintained on regular basis. A similar facility has been provided in the Motor Garage Department to check the flow of hazardous waste in the drain.
(xxxv)	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.	Pre-placement medical examination and periodical medical examination of the workers engaged in the project are carried out and records are maintained. Schedule of health examination of the workers is also drawn and followed accordingly.
(xxxvi)	The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered fauna namely Elephant, Sloth Bear, Plan civet, Panther, Mouse deer etc. spotted in the study area. Action plan for conservation of flora and fauna prepared shall be implemented in consultation with State Forest and Wildlife Department. All the safeguard measures brought out in the Wildlife Conservation Plan prepared specific to this project site shall be effectively implemented. Necessary allocation of funds so allocated shall be included in the project cost. A copy of action plan shall be submitted to the regional office of the Ministry Of Environment and Forests, Bhubaneswar.	Government of Jharkhand has prepared Comprehensive Integrated Wildlife Management Plan (IWMP) for the West Singhbhum District, by an Expert Committee constituted by Govt. of Jharkhand under the aegis of SAIL. The IWMP has been finalized by the Govt. of Jharkhand and is under review by MoEF&CC, New Delhi for implementation. On the instance of State Govt. and MoEF&CC, SAIL Mines has submitted undertakings for proportionate contribution for implementation of the Conservation Plan. However, conservation plans prepared as part of EIA / EMP reports for the leases is being implemented on regular basis.



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(xxxvii)	The entire mining lease area to be fenced by erecting solar powered electric fencing all around it. The fencing so erected shall be maintained properly and the cost towards erection and maintenance of all solar powered electric fencing shall be borne by the project proponent out of the project cost.	As directed by the Forest Department, once the Integrated Wildlife Management Plan is finalized and approved, we will take up the job as per the recommendation of the IWMP.
(xxviii)	No road transportation of ore outside the mine lease area shall be carried out after the sunset.	Entire iron ore from the mine is being dispatched through railways. Hence, no road transportation of ore outside the mine lease area is carried at Gua Ore Mines.
(xxxix)	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.	Most of the construction labour is hired from the local villages. Labours when hired from outside the vicinity of the mines are provided housing facilities along with necessary infrastructure at the existing colony of the mines.
(xl)	The critical parameters such as RSPM (Particulate matter with size less than 10 micron i.e. PM10) and NOx in the ambient air within the impact zone, peak particle velocity at 300m distance or within the nearest habitation, whichever is closer shall be monitored periodically. Further, quality of discharged water shall also be monitored {(TOS, 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 Forests, which is available on the website of the Ministry www.envfor.nic.in shall also be referred in this regard for its compliance.	Environmental Quality Monitoring covering air, water and noise quality at Gua Ore Mines is monitored regularly through JSPCB, Environment Management Division of SAIL and through in-house facilities. The data is digitally displayed in public domain near the main gate of the administrative office. During 2017-18, Gua Ore Mines has installed a Continuous Ambient Air Quality Monitoring System (CAAQMS) for real time monitoring of Ambient Air Quality within the leasehold area and nearby villages. The data is digitally displayed in public domain at the Gua club site within the township. As per the monitoring and analysis of Ambient Air quality, PM ₁₀ ranges from 30.8 - 78.5 µg/m ³ , PM _{2.5} ranges from 15.5-45.2 µg/m ³ , SO ₂ ranges from 6.5-15.2 µg/m ³ and NO ₂ ranges from 6.4-16.4 µg/m ³ . Similarly water parameters are in the range pH ranges from 7.5-7.6, BOD ranges from 3.0 -7.0 mg/l, COD ranges from 20-44 mg/l. The noise level the ranges from 64.4 -70.6 dB (A). The detailed report is enclosed as Annexure-1 and



S.No.	CONDITION	COMPLIANCES
		Annexure-6.
(xli)	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 for approval.	Noted for compliance. We shall submit a Final Mine Closure Plan along with details of Corpus Fund to the Ministry of Environment, Forests & Climate Change 5 years in advance of final mine closure for approval.
(xlii)	Steps to control flow of fines in to the river stream shall be taken.	Based on a study conducted through IIT Kharagpur for identifying places vulnerable to erosion, checking surface runoff and other mitigative measures recommended have been undertaken. Following constructive measures have been undertaken which has resulted in increased retention and quality of effluent discharged from the mines thereby preventing water pollution of Karo River flowing across the township. • Settling Pits for eroded soil and earthen and concrete check dams have been constructed to arrest the flow of fines. • The bank of the Zero Point Nalla has been planted with vetiver to provide stability to the slope. • Boulder Retaining walls at the foot of waste dumps and check dams to check the flow of fines during monsoons. • Bunds along the haul roads and outer periphery of the pits to ensure that no sediment laden storm water get discharged from the mined out area. Additionally following structures have been provided for preventing water pollution: a) A trench of length 150 m, depth 3 m and width 4.5 m has been created in front of the Dam no 1 at a distance of 5m. b) Two trenches of following dimensions have been created in front of the Dam No. 2 with a gap of 20 m between the trenches: a. Length 250 m of depth 3.5 m and width 6m, distance from the dam 5m.

S.No.	CONDITION	COMPLIANCES
		b. Length 220 m of depth 3.5 m and width 6m, distance from the dam 5m. c) 2 trenches have been created between dam no 2 and dam no 3 with the following dimensions: a. Near to dam no 3 of length 300 m, depth 3.5 m and width 6 m at a distance of 5m from the Dam no. 3. b. Near to dam no 2 of length 200 m, depth 3.5 m and width 6 m at a distance of 10 m from the Dam no 2. d) De-siltation pit (200 m x100 m x6 m) has been created in front of the Dam no. 4 by removing 120000 m³ of fines. Major part of the excavated silts were placed near dam no. 5 for embankment to protect flash flood from the zero point nalah and partly dispatched to steel plant after blending with fresh blue dust from mines. The photographs are enclosed as Annexure-9.
(xliii)	A time bound action plan for consumption of accumulated fines as per approved Mine Plan/ EIA /EMP report shall be executed in the beneficiation and Pelletization Plant.	A proposal for faster utilization of fines from the fines dump at Gua Ore Mines was submitted to the MoEF & CC and EAC on 14 th Nov, 2014 which will be complied in view of expansion project envisaging Beneficiation and Pelletisation Plant at Gua Ore Mines.
(xliv)	In order to strengthen the management system staggered trenches shall be provided in all the earthen dams to accommodate maximum silt flow to reduce any pressure in the downstream.	The following five nos. of trenches have been provided in the earthen dams to accommodate maximum silt as well as to reduce the pressure on the dams. A) A trench of length 150 m of depth 3 m and width 4.5 m has been provided in front of the Dam no 1 at a distance of 5m. B) Two trench of following dimensions have been provided in front of the Dam No 2 with a gap of 20 m between the trenches: ➤ Length 250 m, depth 3.5 m and width 6 m, distance from the dam



S.No.	CONDITION	COMPLIANCES
		5m. ➤ Length 220 m, depth 3.5 m and width 6 m, distance from the dam 5m. C) Two trenches have been provided between dam no 2 and dam no 3 with the following dimensions ➤ Length 300 m, depth 3.5 m and width 6 m at a distance of 5m from the Dam no. 3 . ➤ Length 200 m, depth 3.5 m and width 6 m has been provided at a distance of 10 m from the Dam no 2. In addition to the above, a pit (200mx100mx6m) has been provided in front of the Dam no. 4 by removing 120000 m³ of fines. Major part of the excavated silts were placed near dam no 5 for embankment to protect flash flood from the zero point nalla and part of the fines were dispatched to steel plant after blending with fresh blue dust from mines.
(xlv)	The silt collected along the nallas should be removed completely before the onset of next monsoon and should be a regular practice of the mine.	Regular de-silting of all the check dams / nallas is being carried out prior to onset and post monsoon every year. All the 5 earthen dams and 4 nos. settling pits at the foot of Fines Dump are de-silted to retain retention capacity to the tune of 14 lakh m ³ .
(xlvi)	The slopes of the Earthen Dams should be provided with vegetative cover suitably with native species, thorny bushes and vetiver grasses as a part of biological measures of dump management.	The slopes of earthen dams have been stabilized through plantation of vetiver. About 10,000 sq. m area of earthen dam/ silt traps slopes (Dam No 1, Dam No 3 , Dam No 4 and at traps no. 1,2,3,4) has been covered through plantation of Vetiver. The photographs are enclosed as Annexure-10 .
(xlvii)	Monitoring of all water quality parameters as per the discharge standards shall be ensure by the project management.	Water quality is being monitored regularly and reports are being submitted to Jharkhand State Pollution Control Board, Jamshedpur. The water parameters are in the range pH ranges from 7.5-7.6, BOD ranges from 3.0 - 7.0 mg/l, COD ranges from 20-44 mg/l. The detailed report is enclosed as

S.No.	CONDITION	COMPLIANCES
		Annexure-1.
(xlviii)	No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forest.	Noted for compliance.
(xlix)	No further expansion or modifications in the beneficiation and pelletization plants shall be carried out without prior approval of the Ministry of Environment and Forest.	Noted for compliance. No further expansion or modifications in the beneficiation and pelletization plants will be carried out without prior approval of the MoEF&CC.
(l)	No change in the calendar plan including excavation, quantum of mineral iron ore and waste should be made.	There will be no change in the calendar plan including excavation, quantum of mineral iron ore and waste. ROM production at Duarguiburu Iron Ore Mine is maintained within permitted capacity in the approved EC and Mining Plan.
(li)	Four ambient air quality-monitoring station should be established in the core zone as well as in the buffer zone for RSPM (Particulate matter with size less than $10\mu\text{m}$ i.e. PM_{10} and NO_x monitoring. Location of the stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board.	Four ambient air quality-monitoring stations are established in the core zone as well as in the buffer zone for RSPM in consultation with JSPCB. Ambient Air quality monitoring at four locations is being carried out regularly through accredited agency (JSPCB) and also through in house facility. The reports are being submitted to Jharkhand State Pollution Control Board periodically. Additionally, Gua Ore Mines has installed a Continuous Ambient Air Quality Monitoring System (CAAQMS) for real time monitoring of Ambient Air Quality within the leasehold area and nearby villages
(lii)	Data on ambient air quality RSPM (Particulate matter with size less than $10\mu\text{m}$ i.e. PM_{10}) & NO_x 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 months.	Ambient air quality monitoring data is being submitted to MoEF&CC, New Delhi and Regional Office, Ranchi along with the compliance reports. As per the monitoring and analysis of Ambient Air quality, PM_{10} ranges from $30.8-78.5 \mu\text{g}/\text{m}^3$, $\text{PM}_{2.5}$ ranges from $15.5-45.2 \mu\text{g}/\text{m}^3$, SO_2 ranges from $6.5-15.2 \mu\text{g}/\text{m}^3$ and NO_2 ranges from $6.4-16.4 \mu\text{g}/\text{m}^3$. Detailed Air Quality report for the period October, 2017 to March, 2018 is placed as Annexure – 1 and Annexure-6 . Air quality data is also being submitted to Jharkhand

S.No.	CONDITION	COMPLIANCES
		State Pollution Control Board and Central Pollution Control Board.
(lii)	Fugitive dust emissions from all the sources should be controlled regularly. Water spraying arrangement of haul roads, loading and unloading and at transfer points should be provided and properly maintained.	Dust Extractor System & Dust Suppression System has been installed at ore processing areas including loading and unloading areas to control the fugitive dusts. High pressure Water Sprinklers (28 KL) have been deployed for regular water sprinkling of Haul Roads and dust prone areas. In addition to this, permanent sprinklers along the main approach haul roads at crushing plant and other crucial areas have been installed. All these units are being maintained and operated.
(liv)	Measures should be taken for control of noise levels below 85 dB (A) in the work environment. Workers engaged in operations of HEMM, etc should be provided with ear plugs / muffs.	Measures for control of noise levels are being taken regularly to maintain the noise levels below 85 dB A). Workers engaged in operations of HEMM, Ore Crushing & Screening areas, are provided with ear plugs / muffs and are motivated from time to time to use the safety equipments for the whole period of their engagement in work.
(lv)	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.	Necessary provisions for treatment & recycling of effluents from the proposed beneficiation plant will be taken during the commissioning of Beneficiation Plant. Oil and grease trap along with vehicle washing ramp, maintenance bay and covered storage yard for proper handling of hazardous waste for the workshop effluents has already been installed and the same is in operation. A similar facility has been provided in the Motor Garage Department to check the flow of hazardous waste in the drain.
(lvi)	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 program of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed.	Personal Protective Equipment (PPE) i.e. dust masks are provided to all the workers engaged in the dust prone areas i.e. excavation & loading areas, ore handling plants, stacking & loading areas etc. Suitable training on safety and health aspects and Occupational health surveillance program are conducted regularly. A refresher training programme fulfilling the same is carried out on monthly basis for any contractions due to exposure to dust and corrective measures are undertaken accordingly.

S.No.	CONDITION	COMPLIANCES
(lvii)	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.	Environmental Management Cell including laboratory has already been established at the mines. The qualified personnel have taken up the job of strengthening the Environmental Management Cell. Hierarchy of Environment & Lease Department of Gua Ore Mines <pre> graph TD A[General Manager (Mines)] --> B[Dy. General Manager (Environment & Lease)] B --> C[Sr. Manager (Environment & Lease)] C --> D[Junior Manager (Forest & Environment)] </pre>
(lviii)	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.	Funds earmarked for environmental protection measures at the mine are booked separately and not being diverted for other purpose. During the year 2017-18, a budget amount of Rs. 2736.50 lakhs was allocated for environmental protection measures.
(lix)	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.	Noted for compliance. The Duargaburu Iron Ore Mine under Gua Ore Mines is working mine operating since 1958. Installation of various facilities under the 12.5 MTPA expansions will be informed in due time after installation of the facilities.
(lx)	The Regional Office of this Ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office	Full co-operation is being extended to the officers of the Regional Office, MoEF&CC, Ranchi, by furnishing the requisite data/ information / monitoring reports.

S.No.	CONDITION	COMPLIANCES
	by furnishing the requisite data / information / monitoring reports.	
(Ixi)	The project proponent shall submit six monthly reports on the status of compliance of the stipulated environmental clearance conditions including results of monitored data (both in hard copies as well as by email) to the Ministry of Environment and Forests, its Regional Office, Bhubaneswar, the respective Zonal Office of Central Pollution Control Board the State Pollution Control Board. The proponent shall upload the status of compliance of the environmental clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the Ministry of Environment and Forests, Bhubaneswar, the respective Zonal Office of Central Pollution Control Board and the State Pollution Control Board.	Six monthly compliance reports on the status of implementation of environmental safeguards are being submitted to MoEF&CC, New Delhi, Regional Office – MoEF&CC, Ranchi, Central Pollution Control Board and State Pollution Control Board. Copy of the compliance report including environmental quality data is uploaded to the SAIL web site i.e. www.sail.co.in .
(Ixi)	A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parishad / Municipal Corporation, Urban Local Body and the Local NGO, if any, from whom suggestions / representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the Company by the proponent.	Copies of the Environmental Clearance were sent to local Member of Panchayat & Zila Parishad at the time of issuance. The clearance letter is displayed on the Company website i.e. www.sail.co.in .
(Ixi)	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/Tehsildar's Office for 30 days.	Copies of the Environmental Clearance were sent to JSPCB and its regional office at Jamshedpur at the time of issuance.
(Ixiv)	The environmental statement for each financial year ending 31s March in Form V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the	Environmental Statement for each financial year ending 31 st March in Form V is submitted annually. Environment Statement for the financial year 2016-17 was submitted to the Jharkhand State Pollution Control Board

S.No.	CONDITION	COMPLIANCES
	Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the Regional Office of the Ministry of Environment and Forests, Bhubaneswar by e-mail.	(JSPCB) vide letter no. GUA/E&L/ES/2017-18/135 Dated 12.09.2017
(lxv)	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 Board 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 this Ministry located at Bhubaneswar.	Advertisement was published in two daily newspapers on 30.03.2013. (Dainik Bhaskar Daily, Jamshedpur edition on 30.03.2013 and Dainik Jagran Daily edition on 30.03.2013). Also Local Zila Parishad Members, Gram Panchayat Members, Manky & Mundas etc were intimated about the issuance of environment clearance.



(Manash Biswas)

General Manager (Mines)

महाप्रबंधक (खान) गुआ
सेल, आर.एम.डी. गुआ अयस्क खान्
General Manager (Mines), Gua
SAIL, RMD, GUA ORE MINES



JHARKHAND STATE POLLUTION CONTROL BOARD
REGIONAL OFFICE-CUM-LABORATORY, MB/15, NEW HOUSING COLONY
ADITYAPUR, JAMSHEDPUR.

Lab. Ref. No:- 643/2018

Date.....

Analysis report of Physico Chemical Examination of Sewage/Trade Effluent.

1. Name of Sampling Point :- M/s Gua Iron Ore Mines.
At- Gua, Dist- West Singhbhum.
2. Point of Collection :- Final Outlet Near Kali Mandir.
3. Date and Time of Collection :- 20.01.2018 at 11 AM
4. Sample Collected By :- R.O. Cum-Laboratory.
5. Sample Source :- I/E

Sl. No.	PARTICULARS	LIMITS	VALUE OBTAINED
1.	Temp A/W	>40°C	19.5/16
2.	pH	5.5 to 9.0	7.6
3.	BOD ⁵ mg/lit	30.0	5.0
4.	COD mg/lit	250.0	40.0
5.	T.S mg/lit	-	416.0
6.	T.S.S. mg/lit	100.0	112.0
7.	T.D.S mg/lit	-	304.0

Remarks :- The value of TSS was observed beyond the limit prescribed.

Analyst
JSR

[Signature]
11-4-18
Analyst
JSR

[Signature]
11-4-18
Lab. Incharge
Jamshedpur.

[Signature]
11-4-18
Regional Officer
Jamshedpur

Board Analyst



JHARKHAND STATE POLLUTION CONTROL BOARD
REGIONAL OFFICE-CUM-LABORATORY, MB/15 NEW HOUSING COLONY
ADITYAPUR, JAMSHEDPUR.

Web Site- jspcb.org/ Phone- 0657-2383241/ Fax- 0657-2383905

Lab. Ref. No:- 591/2017

Dated-

Analysis Report of Physico Chemical Examination of Sewage/Trade Effluent

1. Name of Sampling point : M/s Gua Iron Ore Mines,
At- Gua, Dist- West Singhbhum.
2. Point of Collection : Final out let Near Kali Mandir
3. Date and time of Collection : 05-07-2017 at 4.0 PM
4. Collected By : Regional Office Cum- Laboratory, Jamshedpur
5. Sample Source : I/E

Sl. No.	Particulars	Limits	Value obtained
1.	Temp A/W	$\pm 30^{\circ} \text{C}$	29.0/ 26.0
2.	pH	5.5 to 9.0	7.6
3.	BOD ₅ mg/l	30.0	7.0
4.	COD mg/l	250.0	44.0
5.	T.S. mg/l	-	392.0
6.	T.S.S. mg/l	100.0	118.0
7.	T.D.S mg/l	-	274.0

Remarks :- The value of TSS was observed beyond the limit prescribed.

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9.6.07.17
Analyst
JSR

[Signature]
26.7.17
Analyst
JSR

[Signature]
26.7.17
Lab. Incharge
Jamshedpur.

[Signature]
26.7.17
Regional Officer
Jamshedpur.

Board Analyst



JHARKHAND STATE POLLUTION CONTROL BOARD
REGIONAL OFFICE-CUM-LABORATORY, MB/15 NEW HOUSING COLONY
ADITYAPUR, JAMSHEDPUR.

Web Site- jspcb.org/ Phone- 0657-2383241/ Fax- 0657-2383905

Lab. Ref. No:- 593/ 2017

Dated-

Analysis Report of Physico Chemical Examination of Sewage/Trade Effluent

1. Name of Sampling point : M/s Gua Iron Ore Mines,
At- Gua, Dist- West Singhbhum.
2. Point of Collection : U/s Karo River at Near Kali Mandir
3. Date and time of Collection : 05.07.2017 at 4.35 PM
4. Collected By : Regional Office Cum- Laboratory, Jamshedpur
5. Sample Source : River

Sl. No.	Particulars	Value obtained
1.	Temp A/W	28.0/ 26.0
2.	pH	7.5
3.	BOD ₃ mg/lit	3.0
4.	COD mg/lit	20.0
5.	T.S. mg/lit	418.0
6.	T.S.S. mg/lit	244.0
7.	T.D.S mg/lit	174.0
8.	Total hardness mg/lit	160.0
9.	Calcium mg/lit	38.4
10.	Magnesium mg/lit	15.616
11.	Alkalinity mg/lit	104.0
12.	Chloride mg/lit	32.0

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Analyst
JSR

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Analyst
JSR

[Signature]
Lab. Incharge
Jamshedpur.

[Signature]
Regional Officer
Jamshedpur.

Board Analyst



JHARKHAND STATE POLLUTION CONTROL BOARD
REGIONAL OFFICE-CUM-LABORATORY, MB/15 NEW HOUSING COLONY
ADITYAPUR, JAMSHEDPUR.

Web Site- jspcb.org/ Phone- 0657-2383241/ Fax- 0657-2383905

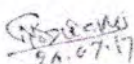
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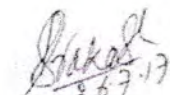
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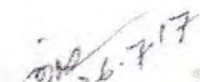
Analysis Report of Physico Chemical Examination of Sewage/Trade Effluent

1. Name of Sampling point : M/s Gua Iron Ore Mines,
At- Gua, Dist- West Singhbhum.
2. Point of Collection : D/s Karo River
3. Date and time of Collection : 05.07.2017 at 4.55 PM
4. Collected By : Regional Office Cum- Laboratory, Jamshedpur
5. Sample Source : River

Sl. No.	Particulars	Value obtained
1.	Temp A/W	27.5/ 25.0
2.	pH	7.5
3.	BOD ₅ mg/l	4.0
4.	COD mg/l	28.0
5.	T.S. mg/l	442.0
6.	T.S.S. mg/l	252.0
7.	T.D.S mg/l	190.0
8.	Total hardness mg/l	182.0
9.	Calcium mg/l	44.0
10.	Magnesium mg/l	17.568
11.	Alkalinity mg/l	112.0
12.	Chloride mg/l	38.0


Analyst
JSR


Analyst
JSR


Lab. Incharge
Jamshedpur.


Regional Officer
Jamshedpur.

Board Analyst



JHARKHAND STATE POLLUTION CONTROL BOARD
ADITYAPUR, JAMSHEDPUR

AMBIENT AIR QUALITY REPORT
(R & D)

Lab. Ref. No:- 1049/2018

Name of the Industry :- M/s Gua Iron Ore Mines,
At- Gua, Dist- West Singhbhum.

No. of Sampling Points-3,
Sampling Position:

Date of Sampling :- 20-21.01.2018

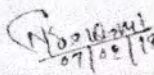
1. Near Club
2. Near Laboratory
3. Near Time office (Mines)

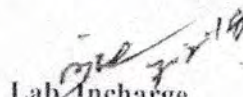
Weather Condition :- Clear

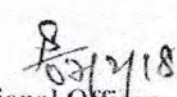
Time	SO ₂	NO _x	RSPM
Point -1			
08.10 AM- 12.10 PM	15.35	26.31	
12.10 PM- 04.10 PM	17.54	29.07	70.39
04.10 PM- 08.10 PM	16.44	24.94	
08.10 PM- 12.10 AM	14.64	23.80	53.52
Maximum	17.54	29.07	70.39
Average	15.99	26.03	61.95
Point -2			
08.20 AM- 12.20 PM	12.70	25.32	
12.20 PM- 04.20 PM	15.89	28.82	91.29
04.20 PM- 08.20 PM	14.11	23.48	
08.20 PM- 12.20 AM	11.80	27.07	81.96
Maximum	15.89	28.82	91.29
Average	13.62	26.17	86.62
Point- 3			
09 AM- 01 PM	19.73	26.31	
01 PM- 05 PM	20.92	30.70	97.33
05 PM- 09 PM	20.28	28.11	
09 PM- 01 AM	18.02	24.43	84.34
Maximum	20.92	30.70	97.33
Average	19.73	27.38	90.83

NOTE :- All value are expressed in micro gram/cubic meter.

Remarks :- The value of all Parameters were observed within the limit prescribed.


Team Incharge
Jamshedpur


Lab Incharge
Jamshedpur.


Regional Officer
Jamshedpur.

Board Analyst



JHARKHAND STATE POLLUTION CONTROL BOARD
REGIONAL OFFICE-CUM-LABORATORY, MB/15, NEW HOUSING COLONY
ADITYAPUR, JAMSHEDPUR.

Lab. Ref. No- 1050/2018

Dated

NOISE LEVEL

The Ambient Noise level Monitoring on 20.01.2018 from 11.40 AM to 12.30 PM of M/s Gua Iron Ore Mines, At- Gua, Dist- West Singhbhum is as follows:-

Sl. No.	Location	Status of the plant.	Prescribed limit in day time.	Noise level dB (A)
1.	Near time office of mines	Operation	75 dB (A)	69.4 dB (A)
2.	Near the entrance of the Mines area.	-do-	-do-	70.2 dB (A)
3.	Near the Laboratory	-do-	-do-	70.6 dB (A)
4.	Near G. M. office	-do-	-do-	64.4 dB (A)

Remarks: - The value of Noise level at all the point were observed within the limit prescribed.

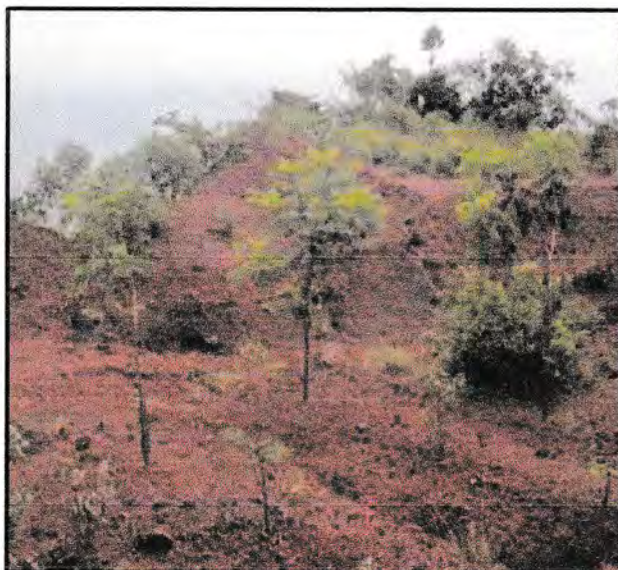
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07/02/18

Team Incharge
Jamshedpur.

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07/02/18
Lab Incharge
Jamshedpur.

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07/02/18
Regional Officer
Jamshedpur.

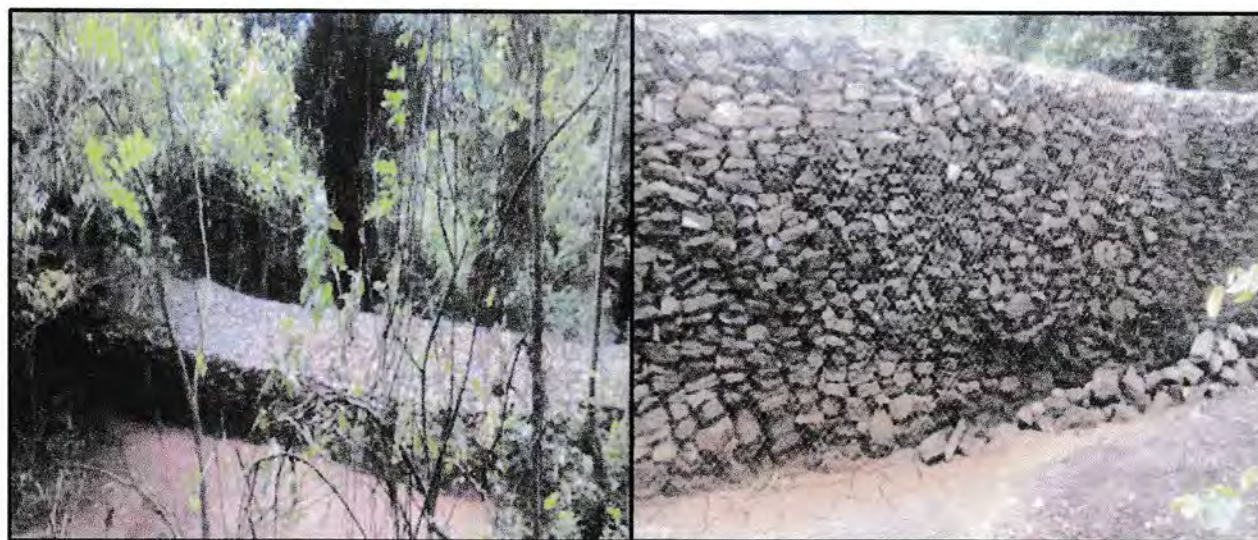
(Board Analyst)

Photographs showing measures undertaken for management of Waste Dump

Photograph 1: Stabilized Old Waste Dump



Photograph 2: Partially Stabilized Portion of Existing Dump



Photograph 3: Constructed Boulder Wall at OT Hill Waste Dump Area



Photographs showing Earthen & Concrete Check Dams at Gua Ore Mines



Photograph 1: Dams at the slope of Fines Heap (Dams 1- 5)
& 04 no.s' of Sedimentation Traps



Photograph 2: Concrete Check dam at Dam No.5 following four nos. of
Sedimentation Traps towards zero point nalla





Pits for Rain-Water Collection at 2nd Level area in Mines



Pits for Rain-Water Collection at Bai Hill area in Mines



Photographs showing Measures undertaken for Management of Air Pollution

Photograph 1: Haul Road Water Sprinklers



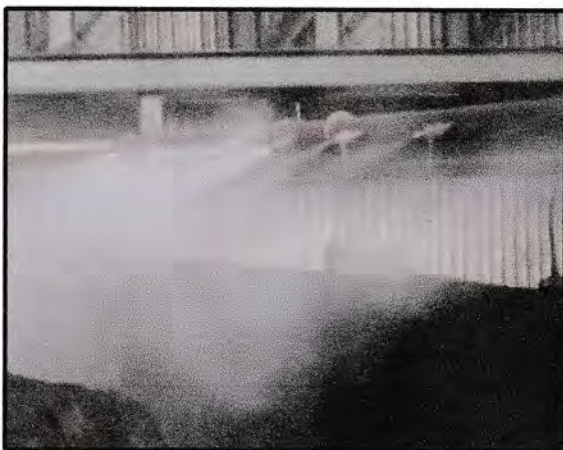
Photograph 2: Permanent Road Sprinklers in Mines



Photograph 3: Permanent Road Sprinklers in Township



Photograph 4: Permanent Sprinklers at OHP



Photograph 5: Dry Fog Dust Suppression System at Hopper



Photograph 6: Dust Extraction System at Crushing Plant



Photographs showing Plantation at Gua Ore Mines

Photograph 1: Plantation on Slopes at OT Hill Area



Photograph 2: Plantation on Slopes at OT Hill Area



Photograph 3: Plantation on Slopes in front of HD Buru Area



Photograph 4: Plantation on Slopes in front of HD Buru Area





Photograph 5: Plantation during World Environment Day Celebration, 2017





Photograph 6: Plantation during ME&MC WEEK Celebration 2017-18



**Gua Ore Mines
Environment Management Cell**

Period: October, 2017 to March, 2018

PM₁₀ (µg/m³)			
Location	Min	Max	Average
Near Hospital	30.8	38.8	35.1
Near Environment & QC Lab	53.6	78.5	60.7
Near Gua Club	44.2	74.6	56.4
Near Time Office	55.8	68.6	60.7
Standard as per NAAQS			100
PM_{2.5} (µg/m³)			
Location	Min	Max	Average
Near Hospital	15.5	28.5	20.0
Near Environment & QC Lab	22.8	45.2	29.4
Near Gua Club	24.2	42.2	31.6
Near Time Office	26.4	39.5	34.7
Standard as per NAAQS			60
SO₂ (µg/m³)			
Location	Min	Max	Average
Near Hospital	6.5	7.2	6.8
Near Environment & QC Lab	7.3	8.5	7.8
Near Gua Club	8.4	12.8	10.2
Near Time Office	11.5	15.2	13.3
Standard as per NAAQS			80
NO_x (µg/m³)			
Location	Min	Max	Average
Near Hospital	6.4	7.6	6.9
Near Environment & QC Lab	7.5	12.5	9.1
Near Gua Club	9.6	15.2	12.6
Near Time Office	11.8	16.4	13.9
Standard as per NAAQS			80

Ankit Gupta
24/05/2018
(Ankit Gupta)
Jr, Mgr. (F&E)

Alok
24/05/18
(Alok Kr. Yadav)
Jr. Mgr. (F&E)

GROUND WATER LEVELS
GROUND WATER LEVELS & QUALITY

LOCATION : Guasai – Forest Bungalow

Parameter	Unit	Acceptable Limit*	Permissible Limit*	Quarter – 3 (October'17)	Quarter – 4 (March'18)
Depth of Water Table below Ground Level	m	-	-	4.9	6.3
Quality					
pH	-	6.5 – 8.5	6.5 – 8.5	6.85	6.76
Turbidity	NTU	1	5	0.4	0.6
Dissolved Solids	mg/l	500	2000	208	212
Iron (as Fe)	mg/l	0.3	0.3	0.14	0.13
Manganese (as Mn)	mg/l	0.1	0.3	0.07	0.08

*as per Drinking Water Specification IS : 10500 : 2012

LOCATION : Ghatkuri Village

Parameter	Unit	Acceptable Limit*	Permissible Limit*	Quarter – 3 (October'17)	Quarter – 4 (March'18)
Depth of Water Table below Ground Level	M	-	-	6.2	7.6
Quality					
pH	-	6.5 – 8.5	6.5 – 8.5	6.76	6.72
Turbidity	NTU	1	5	0.08	0.09
Dissolved Solids	mg/l	500	2000	185	192
Iron (as Fe)	mg/l	0.3	0.3	0.20	0.28
Manganese (as Mn)	mg/l	0.1	0.3	0.09	0.15

*as per Drinking Water Specification IS : 10500 : 2012

LOCATION : Chota Nagra- Baihatu Village

Parameter	Unit	Acceptable Limit*	Permissible Limit*	Quarter – 3 (October'17)	Quarter – 4 (March'18)
Depth of Water Table below Ground Level	m	-	-	8.8	10.5
Quality					
pH	-	6.5 – 8.5	6.5 – 8.5	6.68	6.75
Turbidity	NTU	1	5	0.8	0.6
Dissolved Solids	mg/l	500	2000	155	164
Iron (as Fe)	mg/l	0.3	0.3	0.12	0.09
Manganese (as Mn)	mg/l	0.1	0.3	0.08	0.12

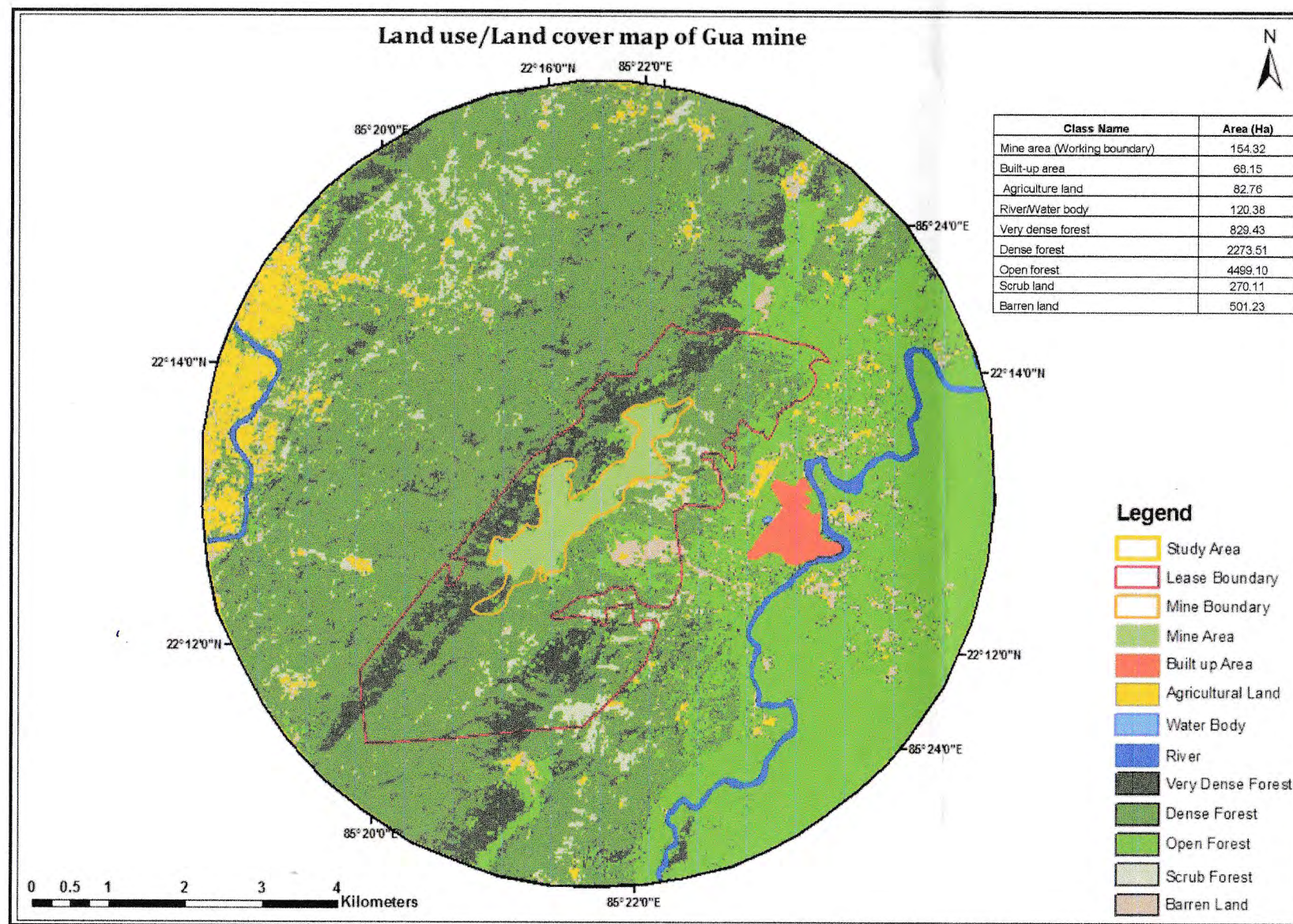
*as per Drinking Water Specification IS : 10500 : 2012

LOCATION : Baraiburu Near Pool

Parameter	Unit	Acceptable Limit*	Permissible Limit*	Quarter – 3 (October'17)	Quarter – 4 (March'18)
Depth of Water Table below Ground Level	m	-	-	8.1	11.2
Quality					
pH	-	6.5 – 8.5	6.5 – 8.5	6.72	6.69
Turbidity	NTU	1	5	0.6	0.7
Dissolved Solids	mg/l	500	2000	175	184
Iron (as Fe)	mg/l	0.3	0.3	0.05	0.07
Manganese (as Mn)	mg/l	0.1	0.3	0.09	0.12

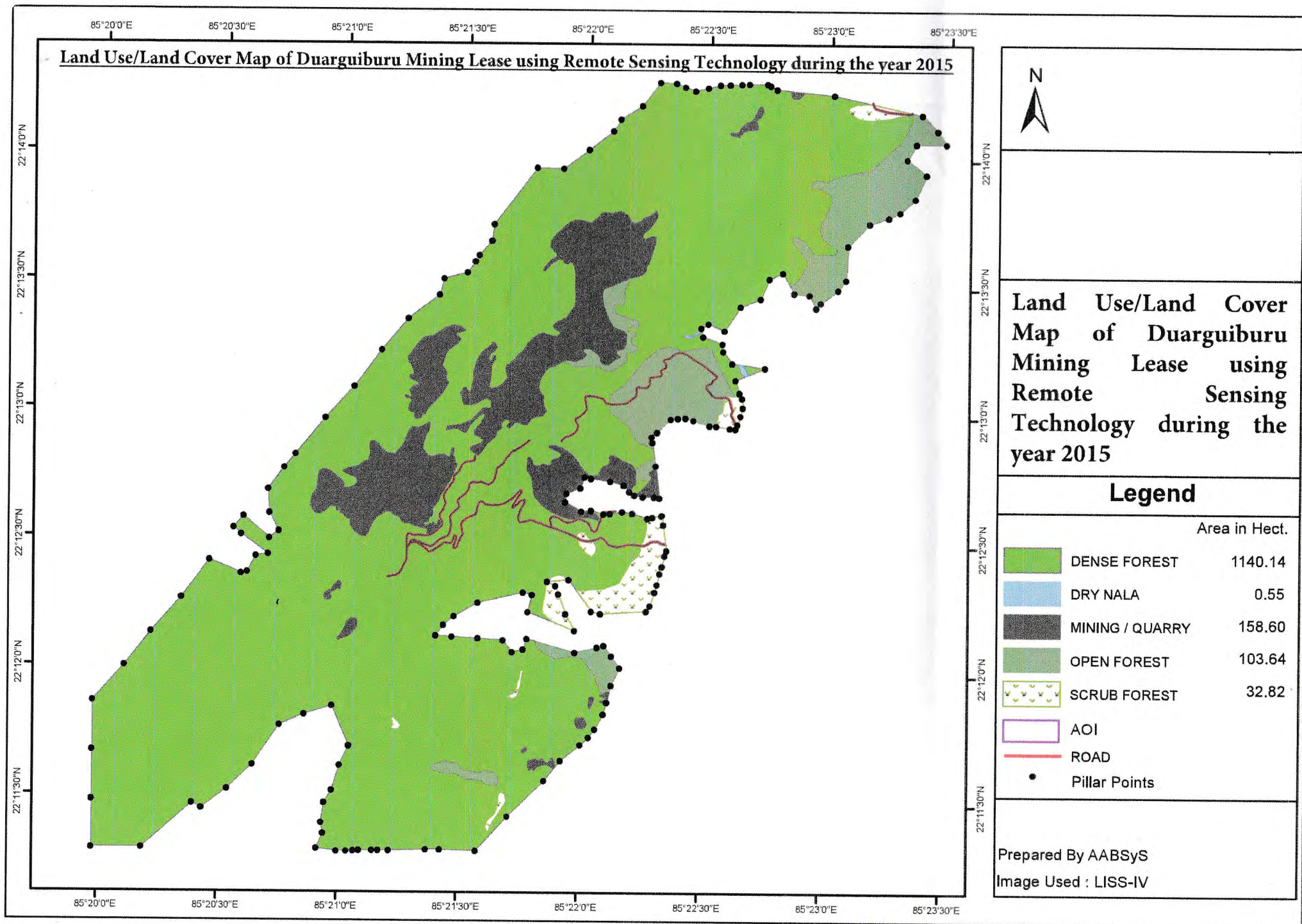
*as per Drinking Water Specification IS: 10500: 2012

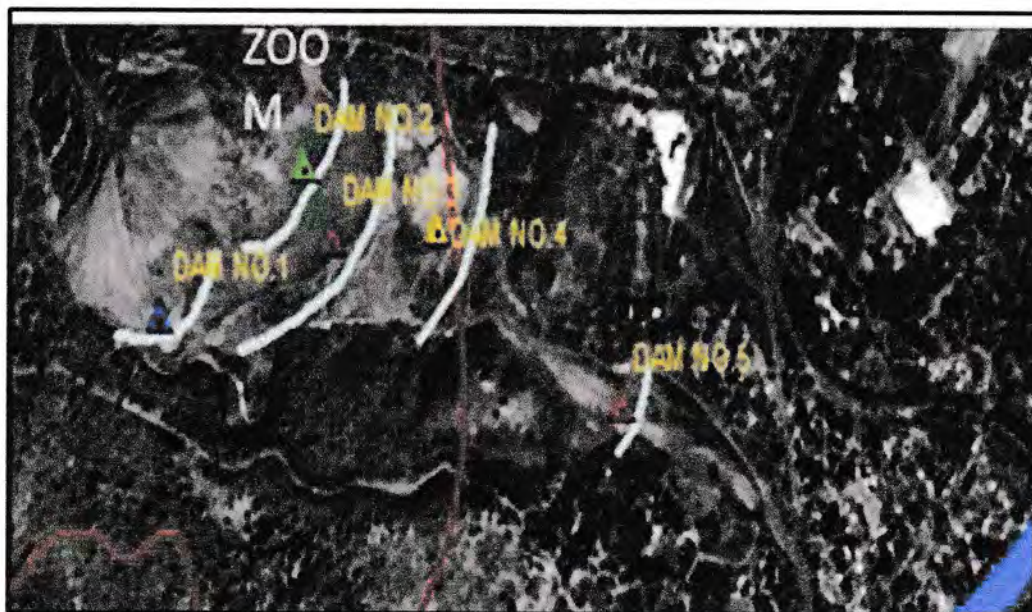
Add
24/05/2018
Chak Kr Yadav
Jr Mgr (F&E)



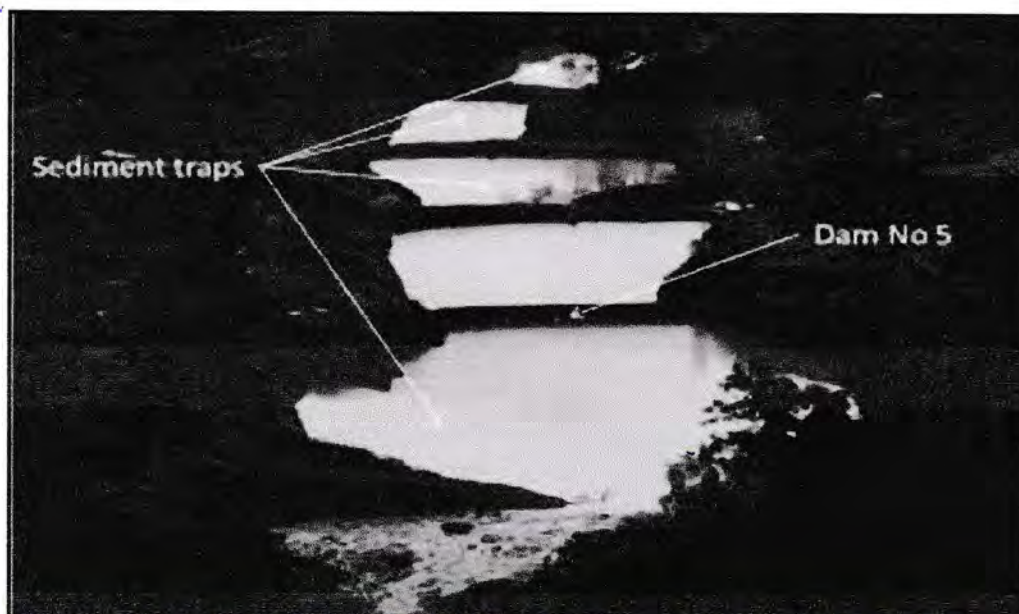
Land Use/Land Cover Map of Duarguiburu Mining Lease alongwith adjoining area (10 Km radius) using Remote Sensing Technology during the year 2012

Ads



Photographs showing Measures undertaken for Steps to control flow of fines in to the river stream

Photograph 1: Google Earth Image of Check Dams and Sediment Traps constructed for control fines



Photograph 2: Check Dams and Settling Pits / Sediment Traps constructed to control flow of fines

Photographs showing Vetiver Plantation on the slopes of Sedimentation Traps

Photograph: Vetiver Plantation to bind the Soil at Slope of Sedimentation Traps

