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/ES/2020-21/ 183

Date: 27.08.2020

To,
The Member Secretary,
Jharkhand State Pollution Control Board,
T.A. Division Building, HEC, Dhurwa,
Ranchi – 834 004, Jharkhand.

Sub: Environment Statement for the Financial Year 2019-20 for Duarguiburu Mining Lease of Gua Ore Mines, Raw Materials Division, M/s. SAIL.

Sir,

Please find enclosed herewith Environment Statement for the Financial Year 2019-20 in FORM-V along with enclosures for Duarguiburu Mining Lease of Gua Ore Mines, Raw Materials Division, M/s. Steel Authority of India Ltd.

We trust that the information furnished is in line with the requirement.

With regards,

For & on behalf of
SAIL-RMD, Gua Ore Mines

27/8/2020

(Bipin Kumar Giri)
Chief General Manager (Mines)

Encl.: As stated above

Copy to: The Regional Officer, Jharkhand State Pollution Control Board (JSPCB), Regional Office Cum Laboratory, M/B 15, New Housing Colony (Opposite to Shiva Mandir), Adityapur, Jamshedpur-831013

FORM – V

Environmental Statement for the Financial Year ending the 31st March, 2020

Duarguiburu Mining Lese, Gua Ore Mines, Raw Materials Division, SAIL

PART – A

(i)	Name & Address of the Owner / Occupier of the Industry Operation or Process	Shri Bipin Kumar Giri, Chief General Manager (Mines) Gua Ore Mines, RMD-SAIL PO - Gua District -West Singhbhum Jharkhand – 833 213
(ii)	Industry Category Primary (STC CODE) Secondary (SIC CODE)s	Open Cast Iron Ore Mining
(iii)	Production Capacity	12.5 million tonne per annum
(iv)	Year of Establishment	1919
(v)	Date of last Environmental Statement Submitted	16/09/2019

27/08/20

27/8/2020

PART – B

Water & Raw Material Consumption

(1) Water consumption m^3/ day

Process
Cooling - } 875.26 m^3/ day **(Industrial use-** Cooling of Engine & spraying of haul road for dust suppression & curing)

Domestic - 6253.04 m^3/ day

(ii) Consumption per unit of production

Name of the product	Process water consumption per unit of product output (m^3 / MT)	
	During the current financial year (2018-19)	**During the current financial year (2019-20)**
(1) Iron Ore	Since the ore is being processed on dry process, there is no process water consumption for processing of iron ore at the mines.	

B. Raw material consumption

Name of the raw material	Name of product	Consumption of raw material per unit Product output (MT/MT of Iron Ore)	
		During the current financial year (2018-19)	**During the current financial year (2019-20)**
Diesel (L/Te)	Iron Ore	0.60	0.64
Lubricants(L/Te)	Iron Ore	0.021	0.024
Explosives(Kg/Te)	Iron Ore	0.07	0.09

27/08/20

PART - C

Pollutant Discharged To Environment / Unit of Output

S. No.	Pollutants	Quantity of pollutants discharged (Mass / day)	Concentrations of pollutants in discharged (Mass / Volume)	Percentage of variation from prescribed standard with reasons
(a)	**Water**			
	There is no facility of washing/ beneficiation, hence no industrial effluent, so discharge of same to environment does not arise. Water quality analysis at the defined points is being carried out on regular basis. Analysis reports are enclosed as **Annexure-1.**			
(b)	**Air**			
	Dust produced due to haulage of materials on road and during crushing of iron ore which is within control limit and being suppressed by water spraying. (Details of protective measures are mentioned in part-G). Ambient air quality monitoring and Noise level measurement at the defined points is being carried out on regular basis. The copies of reports are enclosed as **Annexure-2 & 3** respectively.			

PART – D

Hazardous Wastes

Hazardous Waste		Total Quantity (Kg)	
		During the current financial year (2018-19)	During the current financial year (2019-20)
(a)	From Process (Burnt/Used Oil)	46278	52038
(b)	From pollution control facilities.	Nil	Nil

27/08/20

PART – E

Solid Wastes

Solid waste		Total quantity (Te)	
		During the current financial year (2018-19)	During the current financial year (2019-20)
(a)	From process (overburden)	1345070	697865
(b)	From pollution control facilities	Not applicable	Not applicable
	(i) Qty. recycled or reused within the unit.	Nil	Nil
	(ii) Sold	Nil	Nil
	(iii) Disposed	Nil	Nil

PART – F

PLEASE SPECIFY THE CHARACTERISATIONS (IN TERMS OF COMPOSITION AND QUANTUM) OF HAZARDOUS AS WELL AS SOLID WASTES AND INDICATE DISPOSAL PRACTICE ADOPTED FOR BOTH THESE CATEGORIES OF WASTES

Hazardous Waste is in the form of Burnt Oil/ Used Oil. 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 is in operation. Hazardous Waste is stored in the Lubricant Yard in proper storage drums which is then sold to registered recyclers by Centralized auction through RMD, Kolkata. Solid waste is disposed off in an area which is devoid of iron ore, within the broken area of mining lease boundary with the help of Dumpers.

PART – G

IMPACT OF THE POLLUTION ABATEMENT MEASURES TAKEN ON CONSERVATION OF NATURAL RESOURCES AND ON THE COST OF PRODUCTION

Following measures have been adopted for abatement of pollution and conservation of natural resources: -

❖ Air Pollution Control Measures:

- To control dust, regular water sprinkling is done by 2 no. of 28 KL water sprinklers at mining area and by a 9 KL water sprinkler at township area.
- In addition to this, permanent water pipeline sprinklers (1.75 km) have been installed along the main approach haul roads near crushing plant to OT Hill area and other critical areas.
- Wet drilling facility with all the drills to control dust emissions from drilling operations.
- Use of Slurry Explosives & NONEL Detonation to reduce the blasting emissions
- High Capacity HEMM for handling of ore & waste and reduction of travelling frequencies of the dump trucks and thereby reducing specific emission of pollutants
- Installed permanent sprinklers along the main approach haul roads at crushing plant and other crucial areas, which has significantly reduced the dust levels.
- At crusher hopper nozzles are fitted for water spraying & dry fogging. In addition, we have installed water jet spray at dumping points.
- Two Cyclone type dust extraction systems are adopted at OHP primary and secondary crushing units to control dust emission.

❖ Water Pollution Control Measures

- There is no facility of washing/ beneficiation, hence no industrial effluent, so discharge of same to environment does not arise.
- Series of 05 no. of earthen dams at the foothill of the Fines Heap followed by series of 04 no. Trap Pits (Siltation Ponds) have been provided for arresting eroded soil by providing enough retention time for the soil to settle down during monsoons. Regular desiltation of earthen dams and pits prior to onset of monsoons is carried out every year.
- Further, the slopes of dams and trap pits are stabilized through plantation with species like Vetiver and hedges. As instructed during the visit of Forest officials,

27/08/'20

plantation of native saplings and hedges is being carried out on the slopes of waste dump in consultation with local Forest Department.

- Stabilizing inactive waste dumps by plantation and construction of garland drains.
- Construction toe walls at the waste dumps to control surface runoff and to arrest wash offs.
- Construction of check dams at strategic locations across the nallas to control surface runoff from the mining areas.
- Construction of garland drains around the mine pits, haul roads and diverted surface runoff from the mining and other areas to mine pit, where it is allowed to settle and soaked to into the ground water.

Settling ponds at Gua Ore Mines were constructed to arrest fines from surface run off based on recommendations provided by IIT Kharagpur through their feasibility study report "Remote Sensing & GIS Based Environment Management for Duarguiburu Lease of Gua Ore Mines, SAIL". Regular de-silting of the dams / check dams is practiced prior to onset of every monsoon to increase the retention time for settling the suspended solids and to avoid flow of silts from these areas.

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 cum rain water harvesting pits have been developed at OT Hill Area (Capacity -2100 m^3), 2nd Level Area (Capacity-120000 m^3), Bai Hill and HD Buru Area (Capacity-75000 m^3). Rain 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. Desiltation of these pits is being carried out every year prior to monsoon to maintain their carrying capacity for water retention.

Impact on cost of production:

Sl. No.	Environmental Jobs	Allocated /Expenditure Amount (Rs. in Lakh)
		2019-20
1.	Environmental Protection: • Air Quality Management: Water spraying facilities and operations for dust suppression etc. • Water Quality Management: Water pollution reduction measures such as water sprinklers, check dams, boulder walls, water diversion channels, concrete dams, sedimentation traps & ponds, de-siltation etc. • Prevention and control measures for forest fire control • Extension of fixed water sprinkler at Haul Road • Solid Waste Management • Biomedical Waste Management • Hazardous Waste Management	457
2.	Afforestation, Plantation and Horticulture	55.00
3.	Monitoring and Analysis Facilities and operations for Environmental Quality	10.00
4.	Environmental Awareness Events	6.00
5.	Prevention and control measures for fire control	10.0
	Total	**538.00**

PART – H

ADDITONAL MEASURES / INVESTMENT PROPOSALS FOR ENVIRONMENTAL PROTECTION INCLUDING ABATEMENT POLLUTION, PREVENTION OF POLLUTION

Additional measures taken for environmental protection are as under.

Plantation in and around the mine area-

Gua Ore Mines have a dedicated team of skilled horticulturists for the afforestation and greenery development program at our mines under the supervision of senior experienced person. Assistance of external parties is also being taken for greenery development in and around the mining lease of Gua Ore Mines.

During 2019-20, 2000 saplings of native species like Mango, Jamun, Tamarind, Kaju, Karanj, Sheesham, Neem, Sagon etc. have been planted in mines and townships. Besides this 1000 kg hedge have also been planted in the mines slopes, waste dump slopes and slopes of dams. Distribution of 500 nos. of fruit plant saplings to nearby villagers was carried out on the occasion of World Environment Day and Wildlife Week Celebration, 2019.

To prevent flow of fines and silts in the river during the monsoon season and on the suggestions provided by IIT Kharagpur, Vetiver grass plantations were carried out on the one side slope of the Siltation Ponds covering 2000 square meter area. The flow has been restricted to a large extent.

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.

Afforestation Plan which was implemented during 2019-20 is as under;

Sl. No.	Location	Status
1.	Football Ground	40 Nos. of saplings have been planted all along the inside boundary of the football field. 15 Nos. of saplings have been planted along the outer boundary of the football field. We are in the process of preparation of additional tree guards.
2.	Gua Club	20 Nos. of saplings have been planted all along the inside boundary of the football field.
3.	Ranichua Waste Dump	Approximately 600 kg hedges and local grass have been planted on the slope of Ranichua Waste Dump to minimize soil erosion during the monsoons. 800 Nos. of saplings have been planted on the top slope of Ranichua Waste Dump to arrest the flow of fines.
4.	OT Hill Waste Dump	Approximately 200 kg hedges and local grass have been planted on the bottom slope of OT Hill Waste Dump to minimize soil erosion during the monsoons.
5.	OT Hill Slope	200 nos. of saplings and 100 kg of hedges and local grass have been planted at OT Hill slope.
6.	Baihill Slope	50 nos. of sapling have been planted at Bai Hill Slope.
7.	II Level Slopes	50 nos. of saplings and 100 kg of hedges and local grass have been planted at IInd level slopes.
8.	Jhillingburu-I & Jhillingburu-II	700 nos. saplings have been planted in vacant area of Jhillingburu-I & Jhillingburu-II.
9.	Township	135nos. saplings have been planted in vacant area of Gua Township.
***Summary of Plantation*:**		
Total Saplings planted		*2015 nos.*
Total Hedge and local grass planted		*1000 kg*

PART – I

OTHER PARTICULARS FOR IMPROVING THE QUALITY OF THE ENVIRONMENT

Gua Ore Mines is located in Reserve Forest area which is very prone to forest fire during summer months. To prevent and control forest fire, Gua Ore Mines has undertaken following measures during the year 2019-20;

1) Engaged 6 nos. of firewatchers for 4 months i.e. from February to June, 2019 for ensuring fire protection in and around the lease area of Gua Ore Mines.
2) Awareness programmes were organised through display of banners, knowledge sessions among the villagers.

27/08/20

3) As per the instructions of State Forest Department, financial support of Rs. 2,40,000/- was provided to RFO, Gua for engagement of nearby 4 village samitis' for fire protection.
4) A Leaf Blower Machine was procured and provided to Range Forest Office, Gua for fire prevention in the forest area.
5) Personal Protective Equipments in the form of fire safety shoes in multiple sets were provided to RFO, Gua as necessary measures for fire protection in and around the mining leases of Gua Ore Mines.

High Pressure Water Pump has been installed in two nos. of mobile water sprinklers and one portable High Pressure Water Pump is available at Gua Ore Mines. The same are being utilized in case of any fire emergency, as and when required.

For and on behalf of SAIL, RMD, Gua Ore Mines

27/8/2020

Chief General Manager (Mines)

बिपिन कुमार गिरी
मुख्य महाप्रबंधक (खान)
सेल.आर.एम.डी.गुआ अयस्क खान
Bipin Kumar Giri
Chief General Manager (Mines)
SAIL, RMD, GUA ORE MINES

Annexure-I

INSTITUTE FOR ENVIRONMENTAL MANAGEMENT

ECO ENVIRO LAB

ISO9001:2015, ISO 14001:2015, OHSAS 18001:2007; NABL & JSPCB Accreditation
2208/A, Jagarnath Nagar, Pundag Road, Near Anand Gas Godown, Argora, Ranchi, Jharkhand – 834012.
Email ID – iem2012@Rediffmail.com, Mob. No. – 8407804253.

WASTE WATER QUALITY TEST REPORT
(Industrial Effluent)

Client Name & Address: DUARGUIBURU IRON ORE MINING LEASE, M/S. SAIL, Gua Ore Mines, SAIL Raw Materials Division, Post- Gua Distt: West Singhbhum (Jharkhand).	Type of Industry : Iron Ore Mines Sample Description: Industrial Effluent Sampling Date : 10/06/2020 Sample Regt. Date: 11/06/2020 Sampling Point : Final Outlet Sampling Location : Near Kali Mandir
Test Report No : IEM/EEL/RAN/EW/0111C(A) Report Issue Date : 18/06/2020 Work order No.: Application No : 7951362, Date: 11.04.2020, Time: 05.04 Protocol : IS Method	Sample Quantity : Plastic Container – 2 liter Customer Rept. : Mr. Alok Kumar Yadav Sample Drawn By : Prateek Kumar Bhardwaj & Team

Sl.No.	Tested Parameter	Unit	Method No.	Acceptable Limit * (Inland Surface Water)	Results
1.	pH	...	IS 3025 (Part-11)	5.5-9.0	6.54
2.	Total Suspended Solids	mg/L	IS 3025 (Part-17)	100	21
3.	COD	mg/L	IS 3025 (Part-58)	250	88
4.	BOD (3Days incubation 27°C)	mg/L	IS 3025 (Part-44)	30	7.1
5.	Oil & Grease	mg/L	IS 3025 (Part-39)	10	<4

Results are nearest to round figure accordance with IS 2:1960.
ND- Not Detected

Note:- 1. * Acceptable Limit = GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENTAL POLLUTANTS PART-A : EFFLUENTS, Environment (Protection) Second Amendment Rules, 1993 notified vide G.S.R. 422(E) dated 19.05.1993, published in the Gazette No. 174 dated 19.05.1993.

Tested by
Analyst

Checked By
(Sunil Kumar Singh)
Lab In charge cum Technical Manager

Authorised Signatory
(Dr. S.C. Jain)
(Director & QC Manager)

Note:-1. The results refer only to the tested sample of applicable parameters. 2. The sample will be preserved for a maximum of 7 days on request from the date of issue of the certificate. 3. The certificate shall not be reproduced in part or full and can't be used as evidence or in court of law without prior permission in writing.4. All disputes are subjected to the Ranchi jurisdiction.

REDUCE • REUSE
RECYCLE • RESPECT

INSTITUTE FOR ENVIRONMENTAL MANAGEMENT

ECO ENVIRO LAB

ISO9001:2015, ISO 14001:2015, OHSAS 18001:2007; NABL & JSPCB Accreditation

2208/A, Jagarnath Nagar, Pundag Road, Near Anand Gas Godown, Argora, Ranchi, Jharkhand – 834012.

Email ID – iem2012@Rediffmail.com, Mob. No. – 8407804253.

WASTE WATER QUALITY TEST REPORT
(Hospital Effluent)

Client Name & Address: DUARGUIBURU IRON ORE MINING LEASE, M/S. SAIL, Gua Ore Mines, SAIL Raw Materials Division, Post- Gua Distt: West Singhbhum (Jharkhand).	Type of Industry : **Iron Ore Mines** Sample Description: Hospital Effluent Sampling Date : 10/06/2020 Sample Regt. Date: 11/06/2020 Sampling Point : Neutralization Pit of Pathology Lab Sampling Location : Gua Ore Mines Hospital
Test Report No : IEM/EEL/RAN/EW/0111C(B) Report Issue Date : 18/06/2020 Work order No.: Application No : 7951362, Date: 11.04.2020, Time: 05.04 Protocol : IS Method	Sample Quantity : Plastic Container – 2 liter Customer Rept. : **Mr. Alok Kumar Yadav** Sample Drawn By : Prateek Kumar Bhardwaj & Team

Sl.No.	Tested Parameter	Unit	Method No.	Acceptable Limit * (Inland Surface Water)	Results
1.	pH	...	IS 3025 (Part-11)	5.5-9.0	6.66
2.	Total Suspended Solids	mg/L	IS 3025 (Part-17)	100	69
3.	COD	mg/L	IS 3025 (Part-58)	250	62
4.	BOD (3Days incubation 27°C)	mg/L	IS 3025 (Part-44)	30	4.8
5.	Oil & Grease	mg/L	IS 3025 (Part-39)	10	5.8

Results are nearest to round figure accordance with IS 2:1960.
ND- Not Detected

Note:- 1. * Acceptable Limit = GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENTAL POLLUTANTS PART-A : EFFLUENTS, Environment (Protection) Second Amendment Rules, 1993 notified vide G.S.R. 422(E) dated 19.05.1993, published in the Gazette No. 174 dated 19.05.1993.

Tested by
Analyst

Checked By
(Sunil Kumar Singh)
Lab In charge cum Technical Manager

Authorized Signatory
(Dr. [illegible] Jain)
(Director & QC Manager)

Institute for Environmental Management ★ Ranchi

Note:-1. The results refer only to the tested sample of applicable parameters. 2. The sample will be preserved for a maximum of 7 days on request from the date of issue of the certificate. 3. The certificate shall not be reproduced in part or full and can't be used as evidence or in court of law without prior permission in writing.4. All disputes are subjected to the Ranchi jurisdiction.

REDUCE • REUSE
RECYCLE • RESPECT

INSTITUTE FOR ENVIRONMENTAL MANAGEMENT

ECO ENVIRO LAB

ISO9001:2015, ISO 14001:2015, OHSAS 18001:2007; NABL & JSPCB Accreditation
2208/A, Jagarnath Nagar, Pundag Road, Near Anand Gas Godown, Argora, Ranchi, Jharkhand – 834012.
Email ID – iem2012@Rediffmail.com, Mob. No. – 8407804253.

WASTE WATER QUALITY TEST REPORT
(Domestic Effluent)

Client Name & Address: DUARGUIBURU IRON ORE MINING LEASE, M/S. SAIL, Gua Ore Mines, SAIL Raw Materials Division, Post- Gua Distt: West Singhbhum (Jharkhand).	Type of Industry : **Iron Ore Mines** Sample Description: Domestic Effluent Sampling Date : 10/06/2020 Sample Regt. Date: 11/06/2020 Sampling Point : Final Discharge Sampling Location : Near Railway Bridge
Test Report No : IEM/EEL/RAN/EW/0111C(C) Report Issue Date : 18/06/2020 Work order No.: Application No : 7951362, Date: 11.04.2020, Time: 05.04 Protocol : IS Method	Sample Quantity : Plastic Container – 2 liter Customer Rept. : Mr. Alok Kumar Yadav Sample Drawn By : Prateek Kumar Bhardwaj & Team

Sl.No.	Tested Parameter	Unit	Method No.	Acceptable Limit * (Inland Surface Water)	Results
1.	pH	...	IS 3025 (Part-11)	5.5-9.0	6.17
2.	Total Suspended Solids	mg/L	IS 3025 (Part-17)	100	54
3.	COD	mg/L	IS 3025 (Part-58)	250	67
4.	BOD (3Days incubation 27°C)	mg/L	IS 3025 (Part-44)	30	6.9
5.	Oil & Grease	mg/L	IS 3025 (Part-39)	10	6.1

Results are nearest to round figure accordance with IS 2:1960.
ND- Not Detected

Note:- 1. * Acceptable Limit = GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENTAL POLLUTANTS PART-A : EFFLUENTS, Environment (Protection) Second Amendment Rules, 1993 notified vide G.S.R. 422(E) dated 19.05.1993, published in the Gazette No. 174 dated 19.05.1993.

Tested by
Analyst

Checked By
(Sunil Kumar Singh)
Lab In charge cum Technical Manager

Authorized Signatory
(Dr .S. C. Jain)
(Director & TC Manager)

Institute for Environmental Management ★ Ranchi ★

Note:-1. The results refer only to the tested sample of applicable parameters. 2. The sample will be preserved for a maximum of 7 days on request from the date of issue of the certificate. 3. The certificate shall not be reproduced in part or full and can't be used as evidence or in court of law without prior permission in writing.4. All disputes are subjected to the Ranchi jurisdiction.

REDUCE • REUSE
RECYCLE • RESPECT

INSTITUTE FOR ENVIRONMENTAL MANAGEMENT

ECO ENVIRO LAB

ISO9001:2015, ISO 14001:2015, OHSAS 18001:2007& JSPCB & NABL Accreditation

2208/A, Jagarnath Nagar, Pundag Road, Near Anand Gas Godown, Argora, Ranchi, Jharkhand – 834012.

Email ID – iem2012@Rediffmail.com, Mob. No. – 8407804251, 8407804252, 8407804254.

DRINKING WATER QUALITY TEST REPORT

Industry Name & Address : **DUARGUIBURU IRON ORE MINING LEASE, M/S. SAIL,** **Gua Ore Mines, SAIL Raw Materials Division,** **Post- Gua Distt: West Singhbhum (Jharkhand).**	**Type of Industry : Iron Ore Mines** Sample Description : Drinking Water Sampling Date : 10/06/2020 Sampling Location : General Office Sample Registration Date: 11/06/2020
Test Report No : IEM/EEL/RAN/DW/0111D Report Issue Date : 18/06/2020 Work order No.: **Application No :7951362 ,Date: 11.04.2020 , Time 05:04** Protocol : IS Method & CPCB Guideline	Customer Rept. : Mr. Alok Kumar Yadav Sample Drawn By: Prateek Kumar Bhardwaj and team

Sl. No.	Tested Parameter	Unit	Method No.	Drinking Water Specification IS 10500 :2012		Results	
				Acceptable Limit	Permissible Limit	Inlet	Outlet
1.	pH value	...	IS 3025 (Part-11)	6.5 – 8.5	No Relaxation	7.79	7.01
2.	Total Dissolved Solids	mg/l	IS 3025 (Part-16)	500	2000	211	148
3.	Turbidity	NTU	IS 3025 (Part-10	1	5	1.5	0.8
4.	Alkalinity (as $CaCO_3$)	mg/l	IS 3025 (Part-23)	200	600	88	42
5.	Hardness (as $CaCO_3$)	mg/l	IS 3025 (Part-21)	200	600	108	75
6.	Calcium (as Ca^{+2})	mg/l	IS 3025 (Part-40)	75	200	23	18.4
7.	Magnesium (as Mg^{+2})	mg/l	IS 3025 (Part-46)	30	100	12.12	6.96
8.	Chloride (as Cl)	mg/l	IS 3025 (Part-32)	250	1000	10	02
9.	Sulphate (as SO_4^{-2})	mg/l	IS 3025 (Part-24)	200	400	05	04
10.	Fluoride (as F^-)	mg/l	IS 3025 (Part-60)	1.0	1.5	1.06	0.9
11.	Arsenic (as As)	mg/l	IS 3025 (Part-37)	0.01	0.05	ND*	ND*
12.	Total Chromium (as Cr)	mg/l	IS 3025 (Part-52)	0.05	No Relaxation	0.01	ND*
13.	Iron (as Fe)	mg/l	IS 3025 (Part-53)	0.3	No Relaxation	0.11	0.06
14.	Lead (as Pb)	mg/l	IS 3025 (Part-47)	0.01	No Relaxation	ND*	ND*

Tested by
Analyst

Checked By
(Sunil Kumar Singh)
Lab In charge cum Technical Manager

Authorized Signatory
(Dr. S.C. Jain)
(Director & QC Manager)

Note:-1. The results refer only to the tested sample of applicable parameters. 2. The sample will be preserved for a maximum of 7 days on request from the date of issue of the certificate. 3. The certificate shall not be reproduced in part or full and can't be used as evidence or in court of law without prior permission in writing.4. All disputes are subjected to the Ranchi jurisdiction.

REDUCE • REUSE
RECYCLE • RESPECT

INSTITUTE FOR ENVIRONMENTAL MANAGEMENT

ECO ENVIRO LAB

ISO9001:2015, ISO 14001:2015, OHSAS 18001:2007, JSPCB & NABL Accreditation

2208/A, Jagarnath Nagar, Pundag Road, Near Anand Gas Godown, Argora, Ranchi, Jharkhand – 834012.
Email ID – iem2012@Rediffmail.com, Mob. No. – 8407804251, 8407804252, 8407804254.

SURFACE WATER QUALITY TEST REPORT

KARO RIVER UPSTREAM

INDUSTRY NAME & ADDRESS: **DUARGUIBURU IRON ORE MINING LEASE, M/S. SAIL, Gua Ore Mines, SAIL Raw Materials Division, Post- Gua Distt: West Singhbhum (Jharkhand).**	**Type of Industry : Iron Ore Mines** Sample Description : Surface Water Sampling Date : 10/06/2020 Sampling Location : W.T.P Pump House Sample Registration Date: 11/06/2020
Test Report No : IEM/EEL/RAN/SW/0111E (A) Report Issue Date : 18/06/2020 Work order No.: **Application No :7951362 ,Date: 11.04.2020 , Time 05:04** Protocol : IS Method & CPCB Guideline	Customer Rept. : Mr. Alok Kumar Yadav Sample Drawn By: Prateek Kumar Bhardwaj and team

Si. No.	Tested Parameter	Unit	Method No.	Acceptable Limit ** (Inland Surface Water)	Results
1.	pH value	...	IS 3025 (Part-11)	5.5 to 9.0	7.05
2.	Dissolved Oxygen	mg/l	IS 3025 (Part-38)	----	6.6
3.	Total Dissolved Solids	mg/l	IS 3025 (Part-16)	----	118
4.	Alkalinity (as $CaCO_3$)	mg/l	IS 3025 (Part-23)	----	78
5.	Hardness (as $CaCO_3$)	mg/l	IS 3025 (Part-21)	----	96
	Calcium (as Ca^{+2})	mg/l	IS 3025 (Part-40)	----	62
	Magnesium (as Mg^{+2})	mg/l	IS 3025 (Part-46)	----	8.6
6.	Nitrate (as NO_3)	mg/l	IS 3025 (Part-24	10	6.1
7.	Phosphate (as PO_4^{-2})	mg/l	IS 3025 (Part-31)	5	0.7
8.	Sulphate (as SO_4^{-2})	mg/l	IS 3025 (Part-24)	----	12
9.	Free Ammonia (as NH_3)	mg/l	IS:3025(Part-34)	5	2.2
10.	Total Kjeldhal Nitrogen (as NH_3)	mg/l	IS:3025(Part-34)	100	6.9
11.	BOD	mg/l	IS: 3025(Part-44)	30	4.2
12.	COD	mg/l	IS: 3025(Part-58)	250	57
13.	Iron (as Fe)	mg/l	IS 3025 (Part-53)	3	0.13

Tested by
Analyst

Checked By
(Sunil Kumar Singh)
Lab Incharge cum Technical Manager

Authorized Signatory
(Dr. E.C. Jain)
(Director & QC Manager)

Note:-1. The results refer only to the tested sample of applicable parameters. 2. The sample will be preserved for a maximum of 2 days on request from the date of issue of the certificate. 3. The certificate shall not be reproduced in part or full and can't be used as evidence or in court of law without prior permission in writing.4. All disputes are subjected to the Ranchi jurisdiction

Annexure-2

REDUCE • REUSE
RECYCLE • RESPECT

INSTITUTE FOR ENVIRONMENTAL MANAGEMENT
ECO ENVIRO LAB

ISO9001:2015, ISO 14001:2015, OHSAS 18001:2007, JSPCB & NABL Accreditation
2208/A, Jagarnath Nagar, Pundag Road, Near Anand Gas Godown, Argora, Ranchi, Jharkhand – 834012.
Email ID – iem2012@Rediffmail.com, Mob. No. – 8407804251, 8407804252, 8407804254.

SURFACE WATER QUALITY TEST REPORT

KARO RIVER Downstream

INDUSTRY NAME & ADDRESS:	Type of Industry : Iron Ore Mines
DUARGUIBURU IRON ORE MINING LEASE, M/S. SAIL, Gua Ore Mines, SAIL Raw Materials Division, Post- Gua Distt: West Singhbhum (Jharkhand).	Sample Description : Surface Water Sampling Date : 10/06/2020 Sampling Location : Near Nuia Bridge Sample Registration Date: 11/06/2020
Test Report No : IEM/EEL/RAN/SW/0111E (B) Report Issue Date : 18/06/2020 Work order No.: Application No :7951362 ,Date: 11.04.2020 , Time 05:04 Protocol : IS Method & CPCB Guideline	Customer Rept. : Mr. Alok Kumar Yadav Sample Drawn By: Prateek Kumar Bhardwaj and team

Sl. No.	Tested Parameter	Unit	Method No.	Acceptable Limit ** (Inland Surface Water)	Results
1.	pH value	...	IS 3025 (Part-11)	5.5 to 9.0	7.78
2.	Dissolved Oxygen	mg/l	IS 3025 (Part-38)	----	5.2
3.	Total Dissolved Solids	mg/l	IS 3025 (Part-16)	---	132
4.	Alkalinity (as $CaCO_3$)	mg/l	IS 3025 (Part-23)	---	94
5.	Hardness (as $CaCO_3$)	mg/l	IS 3025 (Part-21)	---	102
	Calcium (as Ca^{+2})	mg/l	IS 3025 (Part-40)	---	76
	Magnesium (as Mg^{+2})	mg/l	IS 3025 (Part-46)	---	5.72
6.	Nitrate (as NO_3)	mg/l	IS 3025 (Part-24	10	6.4
7.	Phosphate (as PO_4^{-2})	mg/l	IS 3025 (Part-31)	5	0.8
8.	Sulphate (as SO_4^{-2})	mg/l	IS 3025 (Part-24)	---	17
9.	Free Ammonia (as NH_3)	mg/l	IS:3025(Part-34)	5	2.4
10.	Total Kjeldhal Nitrogen (as NH_3)	mg/l	IS:3025(Part-34)	100	7.2
11.	BOD	mg/l	IS: 3025(Part-44)	30	5.1
12.	COD	mg/l	IS: 3025(Part-58)	250	77
13.	Iron (as Fe)	mg/l	IS 3025 (Part-53)	3	0.20

Tested by
Analyst

Checked By
(Sunil Kumar Singh)
Lab Incharge cum Technical Manager

Authorized Signatory
(Dr .S. C. Jain)
(Director & CEO, Manager)

Note:-1. The results refer only to the tested sample of applicable parameters. 2. The sample will be preserved for a maximum of 7 days on request from the date of issue of the certificate. 3. The certificate shall not be reproduced in part or full and can't be used as evidence or in court of law without prior permission in writing.4. All disputes are subjected to the Ranchi jurisdiction

Annexure-3

REDUCE • REUSE
RECYCLE • RESPECT

INSTITUTE FOR ENVIRONMENTAL MANAGEMENT

ECO ENVIRO LAB

ISO9001:2015, ISO 14001:2015, OHSAS 18001:2007 & JSPCB Accreditation
2208/A, Jagarnath Nagar, Pundag Road, Near Anand Gas Godown, Argora, Ranchi, Jharkhand – 834012.
Email ID – iem2012@Rediffmail.com, Mob. No. – 8407804253.

Ambient Noise levels Monitoring Report

INDUSTRY NAME & ADDRESS:	**Sample Details:**
DUARGUIBURU IRON ORE MINING LEASE, M/S. SAIL, Gua Ore Mines, SAIL Raw Materials Division, Post- Gua Distt: West Singhbhum (Jharkhand).	**TYPE OF INDUSTRY: Iron Ore Mines** Sample Description : Ambient Noise Level Sampling Date: 09.06.2020 to 10.06.2020 Sample Registration Date : 11.06.2020
Test Report No : IEM/EEL/RAN/NOISE/0111B Report Issue Date : 18/06/2020 Work order No.: **Application No : 7951362 ,Date: 11.04.2020 , Time 05:04** Protocol : IS Method & CPCB Guideline	Customer Rept. : Mr. Alok Kumar Yadav Sample Drawn By: Prateek Kumar Bhardwaj and team

METEROLOGICAL INFORMATION				**Location & Co-ordinate**	
Average Temp (°C)	Average Relative Humidity (%)	Average Barometric Pressure (mm of Hg)	Weather Condition:		
				A_1	**Near Gua Club House** 22°12'41.77"N; 85°22'54.70"E
				B_1	**Near General Office** 22°12'39.80"N; 85°23'01.30"E
				C_1	**Near Mines Time Office** 22°12'54.68"N; 85°21'21.95"E
33.6	**61**	**742.5**	Partly Cloudy	D_1	**Near Hospital** 22°12'39.00"N; 85°22'57.40"E

Equivalent Continuous Sound Level (Leq) in dB

Time Weighted Average 'A' of the level of Sound in decibels on scale A

Result (4 hours Interval) Sound Level-Leq dB(A)									**CPCB Limit in dB(A)**			
	Day Time (DT) (6 AM to 10PM)					**Night Time (NT) (10 PM to 6 AM)**			Area Code	Category of Area Zone	Day Time (6 AM to 10PM)	Night Time (10 PM to 6 AM)
Location	DT_1 (06-10)	DT_2 (10-02)	DT_3 (02-06)	DT_4 (06-10)	AVG.	NT_1 (10-02)	NT_2 (02-06)	AVG.	A	Industrial Area	75	70
A_1	59.4	64.1	62.2	56.5	60.6	48.2	47.6	47.9	B	Commercial Area	65	55
B_1	62.3	69.4	67.1	60.0	64.7	51.2	49.8	50.5	C	Residential Area	55	45
C_1	65.8	73.4	70.7	64.2	68.5	57.6	50.3	54.0	D	Silence Zone	50	40
D_1	43.1	54.3	49.2	52.0	49.6	39.7	38.4	39.1				

Tested by
Analyst

Checked By
Sunil Kumar Singh)
(Lab Incharge cumTechnical Manager)

Authorized Signatory
(Dr. S. C. Jain)
(Director & QC Manager)

Institute for Environmental Management * Ranchi