

SCIENTIFIC RESEARCH LABORATORY

An ISO 9001:2015 (QMS) & OHSAS 45001:2018 Certified Organization
Recognized by Jharkhand State Pollution Control Board
Analytical & Environmental Engineering Laboratory
C- 144, Aman Green City, Pundag, Ranchi- 834 004, Jharkhand
Tele No.: 0651- 2950060, Mobile: 94701 30700, E-mail: nirajksingh2003@yahoo.co.in

Report No. : SRL/RCMPL/FEB/21

Date: 20.02.2021

TEST REPORT

- Name and Address of the Unit : M/s Radha Casting & Metalik (Pvt) Limited.
(M. S. Ingot Unit), At.: Paiki, P.O.: Marar,
District: Ramgarh, Jharkhand.
- Location of Monitoring : Near Main Gate (Beside Office Building)
- Date of Monitoring : 08.02.2021 to 09.02.2021
- Ambient Temperature : 26°C
- Average Relative Humidity : 34 %
- Meteorological Condition : Partly Cloudy
- Results of Ambient Air Quality :

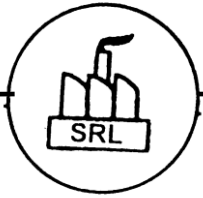
Sl. No.	PARAMETERS	UNIT	RESULTS
1.	Sulphur dioxide (SO ₂)	µg/m ³	15.20
2.	Nitrogen Oxides (NOx)	µg/m ³	27.50
3.	PM ₁₀	µg/m ³	81.40
4.	PM _{2.5}	µg/m ³	48.00
5.	Ozone (O ₃)	µg/m ³	21.00
6.	Lead (Pb)	µg/m ³	<0.02
7.	Carbon monoxide (CO)	mg/m ³	0.78
8.	Ammonia (NH ₃)	µg/m ³	21.00
9.	Benzene (C ₆ H ₆)	µg/m ³	<1.00
10.	Benzo (a) Pyrene (BaP)	ng/m ³	<1.00
11.	Arsenic (As)	ng/m ³	<1.00
12.	Nickel (Ni)	ng/m ³	<4.00

Note: 01. Ambient Fine Dust Sampler [Make Ecotech Instruments, Greater Noida, Model-AAS 190] was used for PM_{2.5} collection.

02. Analysis of Lead (Pb), Arsenic (As), Nickel (Ni), and Benzo (a) Pyrene (BaP) was carried out on PM₁₀ fraction.

for Scientific Research Laboratory,

(Dr. Niraj Kumar Singh)
In-charge, Jharkhand office.



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- Results of Ambient Air Quality :

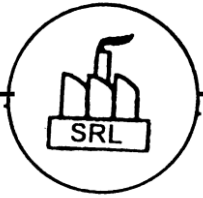
Sl. No.	PARAMETERS	UNIT	RESULTS
1.	Sulphur dioxide (SO ₂)	µg/m ³	16.50
2.	Nitrogen Oxides (NO _x)	µg/m ³	30.20
3.	PM ₁₀	µg/m ³	85.60
4.	PM _{2.5}	µg/m ³	51.00
5.	Ozone (O ₃)	µg/m ³	23.00
6.	Lead (Pb)	µg/m ³	<0.02
7.	Carbon monoxide (CO)	mg/m ³	0.82
8.	Ammonia (NH ₃)	µg/m ³	22.00
9.	Benzene (C ₆ H ₆)	µg/m ³	<1.00
10.	Benzo (a) Pyrene (BaP)	ng/m ³	<1.00
11.	Arsenic (As)	ng/m ³	<1.00
12.	Nickel (Ni)	ng/m ³	<4.00

Note: 01. Ambient Fine Dust Sampler [Make Ecotech Instruments, Greater Noida, Model-AAS 190] was used for PM_{2.5} collection.

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- Average Relative Humidity : 34 %
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- Results of Ambient Air Quality :

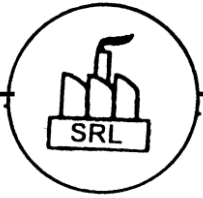
Sl. No.	PARAMETERS	UNIT	RESULTS
1.	Sulphur dioxide (SO ₂)	µg/m ³	16.60
2.	Nitrogen Oxides (NO _x)	µg/m ³	33.50
3.	PM ₁₀	µg/m ³	91.00
4.	PM _{2.5}	µg/m ³	53.00
5.	Ozone (O ₃)	µg/m ³	26.00
6.	Lead (Pb)	µg/m ³	<0.02
7.	Carbon monoxide (CO)	mg/m ³	0.94
8.	Ammonia (NH ₃)	µg/m ³	23.00
9.	Benzene (C ₆ H ₆)	µg/m ³	<1.00
10.	Benzo (a) Pyrene (BaP)	ng/m ³	<1.00
11.	Arsenic (As)	ng/m ³	<1.00
12.	Nickel (Ni)	ng/m ³	<4.00

Note: 01. Ambient Fine Dust Sampler [Make Ecotech Instruments, Greater Noida, Model-AAS 190] was used for PM_{2.5} collection.

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- Average Relative Humidity : 34 %
- Meteorological Condition : Partly Cloudy
- Results of Ambient Air Quality :

Sl. No.	PARAMETERS	UNIT	RESULTS
1.	Sulphur dioxide (SO ₂)	µg/m ³	17.40
2.	Nitrogen Oxides (NOx)	µg/m ³	31.00
3.	PM ₁₀	µg/m ³	79.70
4.	PM _{2.5}	µg/m ³	46.00
5.	Ozone (O ₃)	µg/m ³	24.00
6.	Lead (Pb)	µg/m ³	<0.02
7.	Carbon monoxide (CO)	mg/m ³	0.86
8.	Ammonia (NH ₃)	µg/m ³	22.00
9.	Benzene (C ₆ H ₆)	µg/m ³	<1.00
10.	Benzo (a) Pyrene (BaP)	ng/m ³	<1.00
11.	Arsenic (As)	ng/m ³	<1.00
12.	Nickel (Ni)	ng/m ³	<4.00

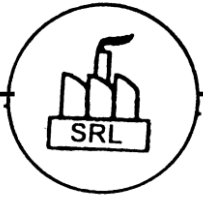
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**M/s RADHA CASTING & METALIK (P) LTD.
(M. S. INGOT UNIT)
At.: PAINKI, P.O.: MARAR, DISTRICT: RAMGARH
JHARKHAND**

AMBIENT NOISE MONITORING DATA

Report No. : SRL/RCMPL/N-01/21

Date of Reporting: 20.02.2021

Monitoring Location	Date of Monitoring	Hours		Sound Pressure Level, dB(A)
		Day Time (06.00-22.00 hr.)	Night Time (22.00-06.00 hr.)	
Near Main Gate (Beside Office Building)	08.02.2021 & 09.02.2021	Day Time (06.00-22.00 hr.)	09.00	55.1
			10.00	56.4
			11.00	57.8
			12.00	59.6
			13.00	60.3
			14.00	61.4
			15.00	62.0
		Night Time (22.00-06.00 hr.)	16.00	62.5
			22.00	53.7
			23.00	52.2
			00.00	48.6
			01.00	47.5
			02.00	47.8
			03.00	48.2
			04.00	50.6
			05.00	52.1

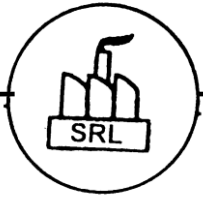
Norms: National Ambient Air Quality Standards (NAAQS) in respect of Noise as per CPCB, New Delhi,
Industrial Area : Day Time 75 dB(A) Leq and Night Time 70 dB(A) Leq
Commercial Area : Day Time 65 dB(A) Leq and Night Time 55 dB(A) Leq
Residential Area : Day Time 55 dB(A) Leq and Night Time 45 dB(A) Leq
Silence Zone : Day Time 50 dB(A) Leq and Night Time 40 dB(A) Leq

Norms: OSHA Norms in work place for 8 hr. exposure: 90 dB (A)

for Scientific Research Laboratory,

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Report No. : SRL/RCMPL/N-01/21

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Monitoring Location	Date of Monitoring	Hours		Sound Pressure Level, dB(A)
		Day Time (06.00-22.00 hr.)	Night Time (22.00-06.00 hr.)	
Near South – East Boundary	08.02.2021 & 09.02.2021	Day Time (06.00-22.00 hr.)	09.10	60.7
			10.10	61.4
			11.10	62.5
			12.10	63.1
			13.10	63.8
			14.10	63.3
			15.10	64.6
			16.10	64.5
		Night Time (22.00-06.00 hr.)	22.10	57.3
			23.10	56.7
			00.10	54.6
			01.10	54.0
			02.10	54.8
			03.10	55.4
			04.10	57.2
			05.10	58.5

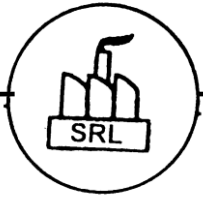
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Report No. : SRL/RCMPL/N-01/21

Date of Reporting: 20.02.2021

Monitoring Location	Date of Monitoring	Hours		Sound Pressure Level, dB(A)
		Day Time (06.00-22.00 hr.)	Night Time (22.00-06.00 hr.)	
Near South – West Boundary (Beside Laboratory)	08.02.2021 & 09.02.2021	Day Time (06.00-22.00 hr.)	09.20	60.3
			10.20	61.8
			11.20	62.1
			12.20	62.9
			13.20	63.4
			14.20	63.7
			15.20	64.0
		Night Time (22.00-06.00 hr.)	16.20	63.4
			22.20	59.2
			23.20	58.0
			00.20	58.5
			01.20	57.4
			02.20	56.8
			03.20	55.5
			04.20	57.0
			05.20	58.4

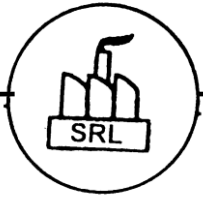
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Report No. : SRL/RCMPL/N-01/21

Date of Reporting: 20.02.2021

Monitoring Location	Date of Monitoring	Hours		Sound Pressure Level, dB(A)
		Day Time (06.00-22.00 hr.)	Night Time (22.00-06.00 hr.)	
Near Staff Quarter	08.02.2021 & 09.02.2021	Day Time (06.00-22.00 hr.)	09.30	57.3
			10.30	56.9
			11.30	57.5
			12.30	58.7
			13.30	59.2
			14.30	59.6
			15.30	59.2
			16.30	60.4
		Night Time (22.00-06.00 hr.)	22.30	54.6
			23.30	53.5
			00.30	54.2
			01.30	52.7
			02.30	51.4
			03.30	52.8
			04.30	54.5
			05.30	55.4

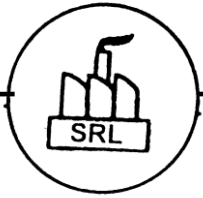
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Silence Zone : Day Time 50 dB(A) Leq and Night Time 40 dB(A) Leq

Norms: OSHA Norms in work place for 8 hr. exposure: 90 dB (A)

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Report No. : SRL/RCMPL/WZ-FD/21

Date: 20.02.2021

WORK ZONE FUGITIVE DUST EMISSION

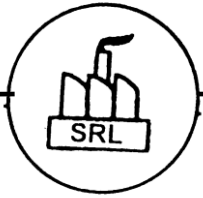
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(M. S. Ingot Unit)
At.- Paiki, P.O.: Marar, District: Ramgarh
Jharkhand.
- Date of Monitoring : 09.02.2021
- Ambient Temperature : 26°C
- Average Relative Humidity : 34 %
- Meteorological Condition : Partly Cloudy
- Results of Fugitive Dust Emission :

Sl. No.	Sample No.	Monitoring Location	Results in $\mu\text{g}/\text{Nm}^3$
			Respirable Suspended Particulate Matter (PM ₁₀)
1.	WZ - 1	Near Raw Material Handling Yard	1794
2.	WZ - 2	Near Induction Furnace	1924
3.	WZ - 3	Near Finished Product Exit Point	1846
4.	WZ - 4	Near Crusher Plant (About 10m from Crushing Unit)	1788
Norms for Fugitive Emission: MoEF & CC Notification, 18 th March, 2016			2000 at 10 metre

The results when compared with norms show that the work zone air quality were well within the stipulated limits.

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STACK MONITORING REPORT

Name of the Industry : M/s Radha Casting & Metalik (Pvt) Limited.
(M. S. Ingot Unit)
At.: Paiki, P.O.: Marar, District: Ramgarh,
Jharkhand.

Date of sampling : 09.02.2021

Weather condition : Partly Cloudy

Stack number if any : Induction Furnace Stack (Electric)

Height of stack from ground level (in metre) : 21.26

Inner dimension of stack (in metre) : 0.40

Height of port hole (in metre) : 7.62

Atmospheric temperature (in °C) : 28

Stack gas temperature (in °C) : 106

Stack gas velocity (in m/s) : 6.58

Volumetric flow rate (in Nm³/hr) : 2341

Dust concentration (in mg/Nm³) : 79

Emission rate (in kg/hr) : 0.185

Name of fuel & quantity used per shift : Electricity

Production capacity : 15,000 T/Annum

Stack attached to : Fume Extraction System with Wet Scrubber

GASES

Sulphurdioxide (in mg/Nm³) as SO₂ : 11

Nitrogenoxides (in mg/Nm³) as NO₂ : 24

Carbon Monoxide (in %) as CO : <0.2%

Carbon dioxide (% v/v by Orsat method) : 5.2

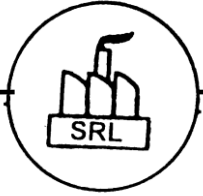
Note: Sampling was carried out at CO₂ 12%

Remarks: Dust concentration was found 79 mg/Nm³ against prescribed limit of 150 mg/Nm³.

for Scientific Research Laboratory,

Niraj

(DR. NIRAJ KUMAR SINGH)
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TEST REPORT

Sample No.: EW- 1
Report No.: SRL/RCMPL/EW-1/21

Reporting Date: 20.02.2021

SAMPLE DRAWN BY SCIENTIFIC RESEARCH LABORATORY

Customer Name & Address : Radha Casting & Metalik (P) Limited.
At.: Paiki, P.O.: Marar, District: Ramgarh
Jharkhand.
Type of the Sample : Cooling Tower Blow- Down Water
Location : Final Outlet
Sampling Method : APHA 20th Edition, 1060B & SRL/QSP/09
Date of Sampling : 09.02.2021
Sample Received On : 09.02.2021
Environmental Condition : Partly Cloudy, Temp. 27^oC

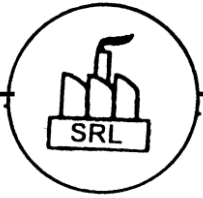
RESULTS

Sl. No.	Parameters	Unit	Permissible Limit	Results
1.	Temperature	°C	-	26.00
2.	pH	-	5.5 – 9.0	7.60
3.	Total Dissolved Solids	mg/l	-	388
4.	Total Suspended Solids	mg/l	100	36
5.	Chemical Oxygen Demand	mg/l	250	56
6.	Biological Oxygen Demand 3 Days at 27°C	mg/l	30	6.0
7.	Oil and Grease	mg/l	10	<5

for Scientific Research Laboratory,

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Tele No.: 0651- 2950060, Mobile: 94701 30700, E-mail: nirajksingh2003@yahoo.co.in

RESULTS OF GROUND WATER ANALYSIS

CLIENT : M/S Radha Casting & Metalik (Pvt) Limited (M. S. Ingot Unit)
AT.: Painki, P.O.: Marar, District: Ramgarh, Jharkhand

DATE OF SAMPLING : 09.02.2021

DATE OF REPORTING: 20.02.2021

Sl. No.	Characteristics	Requirement (desirable limits)	Permissible Limits* in the absence of Alternate Source	Results
				Bore Well Water
1.	Colour, Hazen units, Max.	5	-	< 5
2.	Odour	Unobjectionable	-	Unobjectionable
3.	Taste	Agreeable	-	Agreeable
4.	Turbidity, NTU, Max.	5	10	<0.5
5.	pH Value	6.5 to 8.5	No relaxation	7.34
6.	Total Hardness (as CaCO ₃), mg/l, Max.	300	600	220
7.	Iron (as Fe), mg/l, Max.	0.3	0.30	0.20
8.	Chloride (as Cl), mg/l, Max.	250	1000	42
9.	Residual Free Chlorine, mg/l, Min.	0.2	-	< 0.1
10.	Fluoride (as F) mg/L, Max.	1.0	1.5	0.56
11.	Dissolved Solids mg/l, Max.	500	2000	318
12.	Calcium (as Ca), mg/l, Max.	75	200	56
13.	Magnesium (as Mg), mg/L, Max.	30	100	21
14.	Copper (Cu), mg/l, Max.	0.05	1.5	< 0.01
15.	Manganese (as Mn), mg/l, Max.	0.1	0.3	0.02
16.	Sulphate (as SO ₄), mg/l, Max.	200	400	18
17.	Nitrate (as NO ₃), mg/l, Max.	45	100	3.6
18.	Mercury (as Hg), mg/l, Max.	0.001	No relaxation	< 0.0005
19.	Cadmium (as Cd), mg/l, Max.	0.003	No relaxation	< 0.001
20.	Selenium (as Se), mg/l, Max.	0.01	No relaxation	< 0.005
21.	Arsenic (as As), mg/l, Max.	0.01	No relaxation	< 0.01
22.	Cyanide (as CN), mg/l, Max.	0.05	No relaxation	< 0.01
23.	Lead (as Pb), mg/l, Max.	0.01	No relaxation	< 0.005
24.	Chromium (as Cr ⁶⁺), mg/l, Max.	0.05	No relaxation	< 0.01
25.	Alkalinity (as CaCO ₃) mg/l, Max.	200	600	220
26.	Aluminium (as Al) mg/l, Max.	0.03	0.2	< 0.01
27.	Boron, mg/l, Max.	1.0	5	< 0.1
28.	Total Coliforms Count,MPN/100ml	**	-	Nil

IS: 10500 (2012): Norms for drinking water

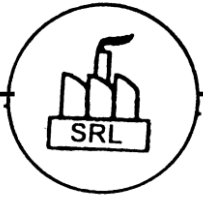
* IS: 10500 : 1991 Drinking water – Specification and amendment no. 01, January 1993.

- **
- Throughout any year, 95% of samples should not contain Coliform organisms in 100 ml.
 - No samples should contain E. Coli in 100 ml.
 - No samples should contain more than 10 Coliform organisms per 100 ml.
 - Coliform organisms should not be detected in 100 ml of any two consecutive samples.

for Scientific Research Laboratory,

Niraj

(Dr. Niraj Kumar Singh)
In-charge, Jharkhand Office



SCIENTIFIC RESEARCH LABORATORY

An ISO 9001:2015 (QMS) & OHSAS 45001:2018 Certified Organization

Recognized by Jharkhand State Pollution Control Board

Analytical & Environmental Engineering Laboratory

C- 144, Aman Green City, Pundag, Ranchi- 834 004, Jharkhand

Tele No.: 0651- 2950060, Mobile: 94701 30700, E-mail: nirajksingh2003@yahoo.co.in

RESULTS OF SURFACE WATER ANALYSIS

Client : M/s Radha Casting & Metalik (P) Ltd.
At: Paiki, P.O.: Marar, District: Ramgarh, Jharkhand.

Sample Received on : 09.02.2021

Date of Reporting: 20.02.2021

Sl. No.	Parameters	Reservoir Water (Within Plant Campus)
1.	Colour, Hazen units, Max.	< 5
2.	pH Value	7.60
3.	Electrical Conductivity, μ mhos/cm	604
4.	Dissolved Oxygen (as O ₂), mg/l	5.4
5.	BOD, 5 days at 20° C, mg/l	2.6
6.	Total Hardness (as CaCO ₃), mg/l, Max.	112
7.	Iron (as Fe), mg/l, Max.	0.22
8.	Chloride (as Cl), mg/l, Max.	46.00
9.	Fluoride (as F) mg/L, Max.	0.50
10.	Dissolved Solids mg/l, Max.	376
11.	Total Suspended Solids mg/l, Max.	44
12.	Calcium (as Ca), mg/l, Max.	52.00
13.	Magnesium (as Mg), mg/L, Max.	21.00
14.	Copper (Cu), mg/l, Max.	<0.01
15.	Manganese (as Mn), mg/l, Max.	0.02
16.	Sulphate (as SO ₄), mg/l, Max.	84.00
17.	Nitrate (as NO ₃), mg/l, Max.	26.00
18.	Alkalinity (as CaCO ₃) mg/l, Max.	230
19.	Oil & Grease, mg/l, Max.	<0.10
20.	Total Coliform Count, MPN/100ml	340

Water Quality Criteria as per Central Pollution Control Board is as follows:

Parameters	Class A	Class B	Class C	Class D	Class E
1. pH	6.5–8.5	6.5–8.5	6.0-9.0	6.5–8.5	6.5–8.5
2. Dissolved oxygen (as O ₂), mg/l, min	6	5	4	4	-
3. BOD, 5 days at 20° C, max	2	3	3	-	-
4. Total coliform organism, MPN/100 ml, max	50	500	5000	-	-
5. Free ammonia (as N), mg/l, max	-	-	-	1.2	-
6. Electrical conductivity, μ mhos/cm, max	-	-	-	-	2250
7. Sodium absorption ratio, max.	-	-	-	-	26
8. Boron (as B), mg/l, max.	-	-	-	-	2

Class A: Drinking water source without conventional treatment but after disinfection

Class B: Outdoor bathing (organized)

Class C: Drinking water source after conventional treatment and after disinfection

Class D: Propagation of Wild life and Fisheries

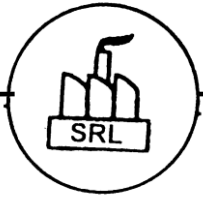
Class E: Irrigation, Industrial Cooling, and Controlled Waste Disposal

Below E: Not meeting A, B, C, D & E Criteria

for Scientific Research Laboratory,

Niraj

(Dr. Niraj Kumar Singh)
In-charge, Jharkhand Office.



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LECHATE ANALYSIS REPORT

Report No.: SRL/RCMPL/LA/FEB/2021

Date of Reporting: 20.02.2021

SAMPLE NOT DRAWN BY SCIENTIFIC RESEARCH LABORATORY

Client Name & Address : Radha Casting & Metalik (P) Limited.
At.: Paiki, P.O.: Marar, District: Ramgarh
Jharkhand.
Sample Submitted by : Radha Casting & Metalik (P) Limited.
Type of Sample : Slag
Sample Received on : 09.02.2021

Analysis Report

Sl. No.	Parameters	EPA Regulatory Level, mg/l	Results (mg/l in extract)
1.	Arsenic (as As)	5.0	<0.020
2.	Cadmium (as Cd)	1.0	<0.010
3.	Chromium (as Cr)	5.0	<0.050
4.	Lead (as Pb)	5.0	<0.050
5.	Mercury (as Hg)	0.2	<0.005
6.	Selenium (as Se)	1.0	<0.010
7.	Silver (as Ag)	5.0	<0.050

Note: The sample was extracted with extraction fluid- 1 (pH 4.93 ± 0.05) in 1:20 ratio for 18 hours. The extraction fluid was selected after pH study of the sample (Ref: EPA Method 1311: Toxicity Characteristic Leaching Procedure).

for Scientific research Laboratory,

(Dr. Niraj Kumar Singh)
In-charge, Jharkhand Laboratory.