

Visiontek Consultancy Services Pvt. Ltd.

(Committed For Better Environment)

Certified for : ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 (OH&S), ISO/IEC 17025:2017

Accredited by : NABET-A Grade, MOEF & CC/CPCB & SPCB-A Grade

Laboratory Services
 Environment Lab
 Food Lab
 Material Lab
 Soil Lab
 Mineral Lab
 &
 Microbiology Lab

- Infrastructure Engineering
- Water Resource Management
- Environmental & Social Study

- Surface & Sub-Surface Investigation
- Quality Control & Project Management
- Renewable Energy

- Agricultural Development
- Information Technology
- Public Health Engineering

- Mine Planning & Design
- Mineral/Sub-Soil Exploration
- Waste Management Services

Ref : Envlab/22/R- 8576

Date : 08.11.2022

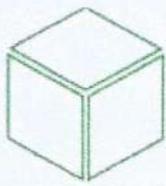
AMBIENT AIR QUALITY (CORE ZONE) MONITORING REPORT- OCT 2022

1. Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED , BHADRAK
2. Name of the Project : KALARANGIATTA CHROMITE MINES , KALIAPANI, JAJPUR
3. Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Monitor, VOC Sampler
4. Sample Collected by : VCSPL Representative in presence of Client's Representative

Monitoring Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)	O ₃ (µg/m ³)	NH ₃ (µg/m ³)	C ₆ H ₆ (µg/m ³)	Bap (ng/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)
	AAQMS-1: Near Office Building											
05.10.2022	67.2	42.2	8.3	13.7	0.48	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.10.2022	66.8	41.9	8.2	12.8	0.50	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.10.2022	65.7	42.7	8.1	13.4	0.47	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.10.2022	69.1	43.3	8.0	13.3	0.52	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.10.2022	66.4	43.5	8.2	13.1	0.48	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.10.2022	64.8	42.8	7.9	13.5	0.50	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.10.2022	66.2	42.4	8.3	13.8	0.49	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29.10.2022	67.3	43.6	8.2	13.6	0.49	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Monthly Average	66.7	42.8	8.1	13.4	0.49	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NAAQ Standard	100	60	80	80	4	100	400	5	01	01	20	06
Monitoring Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)	O ₃ (µg/m ³)	NH ₃ (µg/m ³)	C ₆ H ₆ (µg/m ³)	Bap (ng/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)
	AAQMS-2: Near ETP											
05.10.2022	71.8	42.7	7.8	15.2	0.52	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.10.2022	72.0	41.9	7.9	14.9	0.49	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.10.2022	71.6	43.2	7.5	15.3	0.53	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.10.2022	71.5	40.6	7.7	15.1	0.51	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.10.2022	72.2	42.6	8.1	15.4	0.55	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.10.2022	70.6	41.9	7.8	15.5	0.48	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.10.2022	70.9	43.3	7.9	15.2	0.54	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29.10.2022	71.3	42.8	8.2	15.6	0.55	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Monthly Average	71.5	42.4	7.9	15.3	0.52	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NAAQ Standard	100	60	80	80	4	100	400	5	01	01	20	06
Testing Method	Gravimetric	Gravimetric	Improved West and Geake method	Modified Jacob & Hochheiser (Na-Arsenite)	NDIR Spectroscopy	Chemical Method	Indo Phenol Blue Method	Absorption & Desorption followed by GC	Solvent Extraction Followed by GC	AAS Method	AAS Method	AAS Method

BDL (Below Detection Limit) PM₁₀ < 20 µg/m³, PM_{2.5} < 10 µg/m³, SO₂ < 4 µg/m³, NO_x < 6 µg/m³, O₃ < 4 µg/m³, NH₃ < 20 µg/m³, C₆H₆ < 4 µg/m³, Bap < 0.5 ng/m³, As < 1 ng/m³, Ni < 2.5 ng/m³, Pb < 0.02 µg/m³





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Ref : Envlab/22/R-8577

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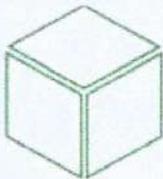
AMBIENT AIR QUALITY (CORE ZONE) MONITORING REPORT- OCT 2022

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4. Sample Collected by : VCSPL Representative in presence of Client's Representative

Monitoring Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)	O ₃ (µg/m ³)	NH ₃ (µg/m ³)	C ₆ H ₆ (µg/m ³)	Bap (ng/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)
AAQMS-3: Near Electrical Substation												
05.10.2022	70.6	42.6	8.8	18.6	0.53	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.10.2022	71.2	41.7	8.5	18.2	0.51	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.10.2022	71.4	42.3	7.9	17.9	0.55	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.10.2022	70.6	42.5	8.3	18.1	0.56	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.10.2022	69.8	42.0	8.2	18.5	0.58	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.10.2022	70.3	41.9	8.5	18.7	0.52	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.10.2022	70.7	43.1	8.0	18.2	0.53	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29.10.2022	71.2	42.7	8.4	18.4	0.54	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Monthly Average	70.7	42.3	8.3	18.3	0.54	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NAAQ Standard	100	60	80	80	4	100	400	5	01	01	20	06
Monitoring Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)	O ₃ (µg/m ³)	NH ₃ (µg/m ³)	C ₆ H ₆ (µg/m ³)	Bap (ng/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)
AAQMS-4: Near Weigh Bridge												
05.10.2022	70.6	45.2	9.2	14.5	0.54	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.10.2022	71.2	44.9	8.9	14.9	0.51	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.10.2022	71.7	41.6	9.3	14.1	0.55	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.10.2022	70.6	42.7	9.0	14.4	0.52	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.10.2022	71.3	42.5	8.7	14.6	0.50	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.10.2022	71.5	43.4	9.1	14.7	0.56	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.10.2022	72.1	45.1	9.3	14.2	0.53	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29.10.2022	72.2	44.8	9.2	14.8	0.51	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Monthly Average	71.4	43.8	9.1	14.5	0.53	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NAAQ Standard	100	60	80	80	4	100	400	5	01	01	20	06
Testing Method	Gravimetric	Gravimetric	Improved West and Geake method	Modified Jacob & Hochheiser (Na-Arsenite)	NDIR Spectroscopy	Chemical Method	Indo Phenol Blue Method	Absorption & Desorption followed by GC	Solvent Extraction Followed by GC	AAS Method	AAS Method	AAS Method

BDL (Below Detection Limit) PM10 <20 µg/m³, PM 2.5<10 µg/m³, SO₂<4 µg/m³, NO_x<6 µg/m³, O₃<4 µg/m³, NH₃<20 µg/m³, C₆H₆<4 µg/m³, Bap <0.5 ng/m³, As < 1 ng/m³, Ni < 2.5 ng/m³, Pb <0.02 µg/m³





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Ref : Envlab/22/R-8578

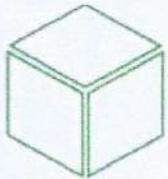
Date : 08.11.2022

AMBIENT AIR QUALITY (BUFFER ZONE) MONITORING REPORT- OCT 2022

1. Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED , BHADRAK
2. Name of the Project : KALARANGIATTA CHROMITE MINES , KALIAPANI, JAJPUR
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4. Sample Collected by : VCSPL Representative in presence of Client's Representative

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AAQMS-1: Near Village Bhimtanagar												
21.10.2022	49.3	27.7	6.8	10.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
AAQMS-2: Near Village Ransol												
21.10.2022	46.2	26.8	7.3	13.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
AAQMS-3: Near Kaliapani Township												
22.10.2022	44.5	25.8	6.	12.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
AAQMS-5: Near Village Baragaji												
21.10.2022	53.2	31.4	6.7	12.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL





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Ref : Envlab/22/R-8579

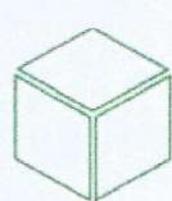
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AMBIENT AIR QUALITY (BUFFER ZONE) MONITORING REPORT- OCT 2022

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Monitoring Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)	O ₃ (µg/m ³)	NH ₃ (µg/m ³)	C ₆ H ₆ (µg/m ³)	Bap (ng/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)
AAQMS-1: Near Village Bhimtanagar												
15.10.2022	47.3	27.6	7.2	10.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
AAQMS-2: Near Village Ransol												
15.10.2022	45.3	26.5	7.4	13.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
AAQMS-3: Near Kaliapani Township												
14.10.2022	44.7	25.3	7.1	12.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
AAQMS-4: Near Village Godisahi												
14.10.2022	50.2	30.1	6.6	11.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL





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Ref : Envlab/22/R-0128

Date : 07.12.2022

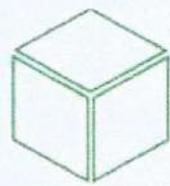
AMBIENT AIR QUALITY (CORE ZONE) MONITORING REPORT- NOV 2022

- Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED , BHADRAK
- Name of the Project : KALARANGIATTA CHROMITE MINES , KALIAPANI, JAJPUR
- Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Monitor, VOC Sampler
- Sample Collected by : VCSPL Representative in presence of Client's Representative

Monitoring Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)	O ₃ (µg/m ³)	NH ₃ (µg/m ³)	C ₆ H ₆ (µg/m ³)	Bap (ng/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)
AAQMS-1: Near Office Building												
02.11.2022	67.4	42.2	8.5	14.2	0.53	BDL	BDL	BDL	BDL	BDL	BDL	BDL
05.11.2022	69.2	41.9	8.4	14.7	0.56	BDL	BDL	BDL	BDL	BDL	BDL	BDL
09.11.2022	64.8	42.7	8.3	13.1	0.49	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.11.2022	70.2	43.3	7.9	14.9	0.59	BDL	BDL	BDL	BDL	BDL	BDL	BDL
16.11.2022	65.7	43.5	8.0	12.4	0.48	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.11.2022	66.5	42.8	7.8	12.2	0.51	BDL	BDL	BDL	BDL	BDL	BDL	BDL
23.11.2022	67.5	42.4	8.2	13.2	0.47	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.11.2022	68.4	43.6	8.4	13.4	0.50	BDL	BDL	BDL	BDL	BDL	BDL	BDL
30.11.2022	68.9	42.7	8.3	13.3	0.48	BDL	BDL	BDL	BDL	BDL	BDL	BDL
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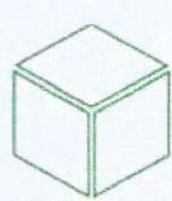
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AAQMS-3: Near Electrical Substation												
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05.11.2022	70.6	41.7	8.5	18.2	0.62	BDL	BDL	BDL	BDL	BDL	BDL	BDL
09.11.2022	68.9	42.3	7.9	17.5	0.57	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.11.2022	71.5	42.5	8.3	18.7	0.62	BDL	BDL	BDL	BDL	BDL	BDL	BDL
16.11.2022	73.4	42	9.2	19.2	0.65	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.11.2022	71.6	41.9	8.5	18.6	0.62	BDL	BDL	BDL	BDL	BDL	BDL	BDL
23.11.2022	70.4	43.1	8.0	18.3	0.61	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.11.2022	71.5	42.7	8.4	18.1	0.62	BDL	BDL	BDL	BDL	BDL	BDL	BDL
30.11.2022	70.7	42.3	8.1	18.4	0.60	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Monthly Average	71.2	42.4	8.5	18.4	0.62	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NAAQ Standard	100	60	80	80	4	100	400	5	01	01	20	06
Monitoring Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)	O ₃ (µg/m ³)	NH ₃ (µg/m ³)	C ₆ H ₆ (µg/m ³)	Bap (ng/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)
AAQMS-4: Near Weigh Bridge												
02.11.2022	71.5	46.7	9.5	14.9	0.56	BDL	BDL	BDL	BDL	BDL	BDL	BDL
05.11.2022	70.7	44.9	8.7	14.4	0.52	BDL	BDL	BDL	BDL	BDL	BDL	BDL
09.11.2022	72.3	46.3	9.7	15.3	0.59	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.11.2022	71.6	42.7	8.9	14.6	0.55	BDL	BDL	BDL	BDL	BDL	BDL	BDL
16.11.2022	70.4	44.8	8.2	14.3	0.51	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.11.2022	70.9	45.3	8.8	14.6	0.53	BDL	BDL	BDL	BDL	BDL	BDL	BDL
23.11.2022	73.4	47.2	9.9	15.7	0.61	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.11.2022	72.5	46.5	9.5	15.2	0.59	BDL	BDL	BDL	BDL	BDL	BDL	BDL
30.11.2022	71.6	45.9	9.4	15.3	0.57	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Monthly Average	71.7	45.6	9.2	14.9	0.56	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NAAQ Standard	100	60	80	80	4	100	400	5	01	01	20	06
Testing Method	Gravimetric	Gravimetric	Improved West and Geake method	Modified Jacob & Hochheiser (Na-Arsenite)	NDIR Spectroscopy	Chemical Method	Indo Phenol Blue Method	Absorption & Desorption followed by GC	Solvent Extraction Followed by GC	AAS Method	AAS Method	AAS Method

BDL (Below Detection Limit) PM₁₀<20 µg/m³, PM_{2.5}<10 µg/m³, SO₂<4 µg/m³, NO_x<6 µg/m³, O₃<4 µg/m³, NH₃<20 µg/m³, C₆H₆<4 µg/m³, Bap <0.5 ng/m³, As < 1 ng/m³, Ni < 2.5 ng/m³, Pb <0.02 µg/m³





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Ref : Envlab/22/R-0130

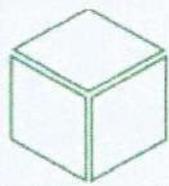
Date :07.12.2022

AMBIENT AIR QUALITY (BUFFER ZONE) MONITORING REPORT- NOV 2022

Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED , BHADRAK
 Name of the Project : KALARANGIATTA CHROMITE MINES , KALIAPANI, JAJPUR
 Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Monitor, VOC Sampler
 Sample Collected by : VCSPL Representative in presence of Client's Representative

Monitoring Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)	O ₃ (µg/m ³)	NH ₃ (µg/m ³)	C ₆ H ₆ (µg/m ³)	Bap (ng/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)
AAQMS-1: Near Village Bhimtanagar												
18.11.2022	52.5	31.4	7.1	11.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
AAQMS-2: Near Village Ransol												
18.11.2022	48.5	28.7	7.5	13.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
AAQMS-3: Near Kaliapani Township												
18.11.2022	46.6	27.7	6.9	12.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
AAQMS-5: Near Village Baragaji												
18.11.2022	57.5	33.2	6.8	12.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL





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- Mineral/Sub-Soil Exploration
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Ref : Envlab/22/R-0131

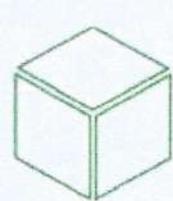
Date :07.12.2022

AMBIENT AIR QUALITY (BUFFER ZONE) MONITORING REPORT- NOV 2022

Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED , BHADRAK
 Name of the Project : KALARANGIATTA CHROMITE MINES , KALIAPANI, JAJPUR
 Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Monitor, VOC Sampler
 Sample Collected by : VCSPL Representative in presence of Client's Representative

Monitoring Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)	O ₃ (µg/m ³)	NH ₃ (µg/m ³)	C ₆ H ₆ (µg/m ³)	Bap (ng/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)
AAQMS-1: Near Village Bhimtanagar												
19.11.2022	49.5	30.6	7.5	11.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
AAQMS-2: Near Village Ransol												
19.11.2022	47.6	28.4	7.7	13.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
AAQMS-3: Near Kaliapani Township												
19.11.2022	46.4	27.5	7.6	12.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
AAQMS-4: Near Village Godisahi												
19.11.2022	51.5	30.5	6.9	11.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL





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Ref : Envlab/22/R-1562

Date :08.01.2023

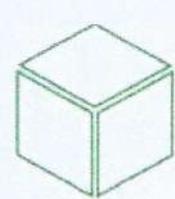
AMBIENT AIR QUALITY (CORE ZONE) MONITORING REPORT- DEC 2022

Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED , BHADRAK
Name of the Project : KALARANGIATTA CHROMITE MINES , KALIAPANI, JAJPUR
Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Monitor, VOC Sampler
Sample Collected by : VCSPL Representative in presence of Client's Representative

Monitoring Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)	O ₃ (µg/m ³)	NH ₃ (µg/m ³)	C ₆ H ₆ (µg/m ³)	Bap (ng/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)
	AAQMS-1: Near Office Building											
03.12.2022	68.3	43.5	8.5	14.3	0.54	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.12.2022	70.2	40.6	8.5	14.8	0.57	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.12.2022	65.6	43.6	8.3	13.2	0.48	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.12.2022	71.6	42.1	7.8	14.9	0.59	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.12.2022	66.4	44.3	8.1	12.4	0.48	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.12.2022	67.8	41.5	7.7	12.3	0.52	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.12.2022	68.5	43.6	8.3	13.2	0.48	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.12.2022	69.3	44.1	8.4	13.5	0.51	BDL	BDL	BDL	BDL	BDL	BDL	BDL
31.12.2022	67.5	43.4	8.2	13.4	0.49	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Monthly Average	68.4	43.0	8.2	13.6	0.52	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NAAQ Standard	100	60	80	80	4	100	400	5	01	01	20	06
Monitoring Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)	O ₃ (µg/m ³)	NH ₃ (µg/m ³)	C ₆ H ₆ (µg/m ³)	Bap (ng/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)
	AAQMS-2: Near ETP											
03.12.2022	73.6	44.6	8.2	16.3	0.55	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.12.2022	72.5	42.5	7.8	15.7	0.55	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.12.2022	71.6	45.6	7.6	15.2	0.52	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.12.2022	73.4	44.2	8.5	16.7	0.48	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.12.2022	72.6	43.6	7.9	15.5	0.52	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.12.2022	73.5	42.8	8.3	16.4	0.54	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.12.2022	71.6	44.5	7.9	15.5	0.48	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.12.2022	72.5	43.4	8.1	15.2	0.56	BDL	BDL	BDL	BDL	BDL	BDL	BDL
31.12.2022	71.7	43.6	7.8	15.6	0.53	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Monthly Average	72.5	43.8	8.0	15.7	0.52	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NAAQ Standard	100	60	80	80	4	100	400	5	01	01	20	06
Testing Method	Gravimetric	Gravimetric	Improved West and Geake method	Modified Jacob & Hochheiser (Na-Arsenite)	NDIR Spectroscopy	Chemical Method	Indo Phenol Blue Method	Absorption & Desorption followed by GC	Solvent Extraction Followed by GC	AAS Method	AAS Method	AAS Method

BDL (Below Detection Limit) PM10 <20 µg/m³, PM 2.5 <10 µg/m³, SO₂ <4 µg/m³, NO₂ <6 µg/m³, O₃ <4 µg/m³, NH₃ <20 µg/m³, C₆H₆ <4 µg/m³, Bap <0.5 ng/m³, As <1 ng/m³, Ni <2.5 ng/m³, Pb <0.02 µg/m³





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• Mineral/Sub-Soil Exploration
• Waste Management Services

Ref : Envlab/22/R-1563

Date : 08.01.2023

AMBIENT AIR QUALITY (CORE ZONE) MONITORING REPORT- DEC 2022

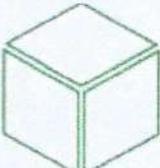
Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED , BHADRAK
Name of the Project : KALARANGIATTA CHROMITE MINES , KALIAPANI, JAJPUR
Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Monitor, VOC Sampler
Sample Collected by : VCSPL Representative in presence of Client's Representative

Monitoring Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)	O ₃ (µg/m ³)	NH ₃ (µg/m ³)	C ₆ H ₆ (µg/m ³)	Bap (ng/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)
AAQMS-3: Near Electrical Substation												
03.12.2022	72.6	43.4	8.8	18.7	0.64	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.12.2022	71.6	40.6	8.4	18.3	0.63	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.12.2022	69.6	42.5	7.8	17.6	0.58	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.12.2022	72.5	41.7	8.4	18.8	0.63	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.12.2022	74.3	43.1	9.2	19.3	0.66	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.12.2022	72.7	42.6	8.5	18.6	0.62	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.12.2022	71.8	45.1	8.1	18.4	0.60	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.12.2022	72.6	44.5	8.5	18.2	0.62	BDL	BDL	BDL	BDL	BDL	BDL	BDL
31.12.2022	71.4	43.6	8.2	18.5	0.61	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Monthly Average	72.1	43.0	8.4	18.4	0.62	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NAAQ Standard	100	60	80	80	4	100	400	5	01	01	20	06
Monitoring Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)	O ₃ (µg/m ³)	NH ₃ (µg/m ³)	C ₆ H ₆ (µg/m ³)	Bap (ng/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)
AAQMS-4: Near Weigh Bridge												
03.12.2022	72.6	45.8	9.6	14.8	0.57	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.12.2022	71.5	45.6	8.7	14.3	0.53	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.12.2022	73.6	47.2	9.6	15.4	0.58	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.12.2022	72.7	42.7	8.9	14.7	0.56	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.12.2022	71.4	45.3	8.3	14.4	0.52	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.12.2022	72.3	44.1	8.7	14.6	0.54	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.12.2022	74.5	48.3	9.8	15.8	0.62	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.12.2022	73.7	47.4	9.6	15.3	0.57	BDL	BDL	BDL	BDL	BDL	BDL	BDL
31.12.2022	72.8	46.5	9.5	15.4	0.58	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Monthly Average	72.7	45.8	9.1	14.9	0.56	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NAAQ Standard	100	60	80	80	4	100	400	5	01	01	20	06
Testing Method	Gravimetric	Gravimetric	Improved West and Geake method	Modified Jacob & Hochheiser (Na-Arsenite)	NDIR Spectroscopy	Chemical Method	Indo Phenol Blue Method	Absorption & Desorption followed by GC	Solvent Extraction Followed by GC	AAS Method	AAS Method	AAS Method

BDL (Below Detection Limit) PM10 <20 µg/m³, PM 2.5 <10 µg/m³, SO₂ <4 µg/m³, NO_x <6 µg/m³, O₃ <4 µg/m³, NH₃ <20 µg/m³, C₆H₆ <4 µg/m³, Bap <0.5 ng/m³, As < 1 ng/m³, Ni < 2.5 ng/m³, Pb < 0.2 µg/m³

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Ref : Envlab/22/R-1564

Date : 08.01.2023

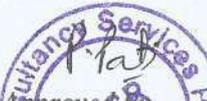
AMBIENT AIR QUALITY (BUFFER ZONE) MONITORING REPORT- DEC 2022

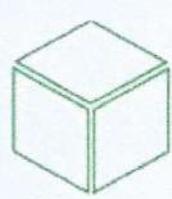
Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED , BHADRAK
 Name of the Project : KALARANGIATTA CHROMITE MINES , KALIAPANI, JAJPUR
 Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Monitor, VOC Sampler
 Sample Collected by : VCSPL Representative in presence of Client's Representative

Monitoring Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)	O ₃ (µg/m ³)	NH ₃ (µg/m ³)	C ₆ H ₆ (µg/m ³)	Bap (ng/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)
AAQMS-1: Near Village Bhimtanagar												
15.12.2022	53.5	32.6	7.2	11.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
AAQMS-2: Near Village Ransol												
15.12.2022	49.6	29.3	7.6	13.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
AAQMS-3: Near Kaliapani Township												
16.12.2022	47.4	28.3	6.8	12.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
AAQMS-5: Near Village Baragaji												
15.12.2022	58.6	34.3	6.7	12.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

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- Mineral/Sub-Soil Exploration
- Waste Management Services

Ref : Envlab/22/R-1565

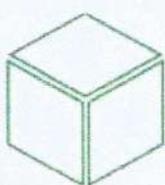
Date : 08.01.2023

AMBIENT AIR QUALITY (BUFFER ZONE) MONITORING REPORT- DEC 2022

Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED , BHADRAK
 Name of the Project : KALARANGIATTA CHROMITE MINES , KALIAPANI, JAJPUR
 Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Monitor, VOC Sampler
 Sample Collected by : VCSPL Representative in presence of Client's Representative

Monitoring Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)	O ₃ (µg/m ³)	NH ₃ (µg/m ³)	C ₆ H ₆ (µg/m ³)	Bap (ng/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)
AAQMS-1: Near Village Bhimtanagar												
15.12.2022	50.2	31.3	7.6	11.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
AAQMS-2: Near Village Ransol												
15.12.2022	48.7	29.2	7.8	13.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
AAQMS-3: Near Kaliapani Township												
16.12.2022	47.4	28.6	7.7	12.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
AAQMS-4: Near Village Godisahi												
16.12.2022	52.8	31.4	6.8	11.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL





- Infrastructure Engineering
- Water Resource Management
- Environmental & Social Study

- Surface & Sub-Surface Investigation
- Quality Control & Project Management
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- Agricultural Development
- Information Technology
- Public Health Engineering

- Mine Planning & Design
- Mineral/Sub-Soil Exploration
- Waste Management Services

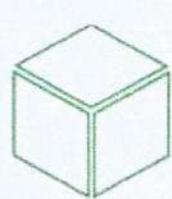
Ref. no: Envlab/22/R-1566

Date: 08.01.2023

GROUND WATER QUALITY ANALYSIS REPORT- DEC 2022

- Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED , BHADRAK
- Name of the Project : Kalarangiatta Chromite Mines , Kaliapani, Jajpur
- Sampling Location : GW1: Tube Well Near TISCO Main Gate
GW2: Tube Well inside the Lease hold Area
GW3: Open Well at Ransol Village
- Method of Sampling : APHA 1060 B
- Date of Sampling : 21.12.2022
- Date of Analysis : 22.12.2022 TO 28.12.2022
- Sample Collected by : VCSPL Representative in presence of Client's Representative

Sl. No.	Parameter	Unit	TEST METHOD	Standard as per IS -10500:2012 Amended on 2015 & 2018	GW1	GW2	GW3
				Permissible Limit			
Physical Parameter							
1	Colour	Hazen,Max	APHA 23 rd Ed,2017 : 2120 B, C	5	<5	<5	<5
2	Odour	--	APHA 23 rd Ed,2017 :2120 B	Agreeable	Agreeable	Agreeable	Agreeable
3	Taste	--	APHA 23 rd Ed,2017 : 2160 C	Agreeable	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU,Max	APHA 2130 B	1	0.4	0.7	0.6
5	pH at 25 ^o C	--	APHA 23 rd Ed,2017 : 4500H ⁺ B	6.5-8.5	6.96	6.73	6.87
6	Dissolved Solids	mg/l,Max	APHA 23 rd Ed,2017 : 2540 C	500	312	278	308
CHEMICAL PARAMETER							
1	Total Hardness (as CaCO ₃)	mg/l,Max	APHA 23 rd Ed,2017 : 2340 C	200	194	188	186
2	Iron (as Fe)	mg/l,Max	APHA 23 rd Ed,2017 : 3111, B	1.0	0.25	0.27	0.26
3	Chloride (as Cl)	mg/l,Max	APHA 23 rd Ed,2017 : 4500Cl B	250	47	39	52
4	Residual, free Chlorine	mg/l,Min	APHA 4500 Cl B	0.2	ND	ND	ND
5	Calcium (as Ca)	mg/l,Max	APHA 23 rd Ed,2017 : 3500Ca B	75	54.5	51.3	50.4
6	Magnesium (as Mg)	mg/l,Max	APHA 3500 Mg B	30	14.0	14.5	14.6
7	Copper (as Cu)	mg/l,Max	APHA 3111 B,C	0.05	BDL	BDL	BDL
8	Manganese (as Mn)	mg/l,Max	APHA 3500Mn B	0.1	BDL	BDL	BDL
9	Sulphate (as SO ₄)	mg/l,Max	APHA 4500 SO ₄ ²⁻ E	200	28	25	26
10	Nitrate (as NO ₃)	mg/l,Max	APHA 4500 NO ₃ ⁻ E	45	7.7	6.3	7.8
11	Fluoride (as F)	mg/l,Max	APHA 4500 F,C	1.0	0.20	0.25	0.29
12	Phenolic Compounds(as C ₆ H ₅ OH)	mg/l,Max	APHA 5530 B,D	0.001	BDL	BDL	BDL
13	Anionic Detergents (as MBAS)	mg/l,Max	APHA 5540 C	0.2	ND	ND	ND
14	Chromium (as Cr ⁺⁶)	mg/l,Max	APHA 3500Cr B	0.05	<0.01	<0.01	<0.01
15	Mineral Oil	mg/l,Max	APHA 5520 B	0.5	BDL	BDL	BDL
16	Alkalinity	mg/l,Max	APHA 2320 B	200	171	185	190
17	Aluminium as(Al)	mg/l,Max	APHA 3500Al B	0.03	BDL	BDL	BDL



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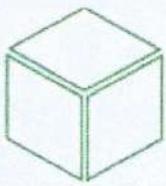
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● Quality Control & Project Management
● Renewable Energy

● Agricultural Development
● Information Technology
● Public Health Engineering

● Mine Planning & Design
● Mineral/Sub-Soil Exploration
● Waste Management Services

18	Boron (as B)	mg/l,Max	APHA 4500 B,B	0.5	BDL	BDL	BDL
19	Polyaromatic hydrocarbons (PAH)	mg/l,Max	APHA 23 rd Ed,2017 :6440 B	0.0001	ND	ND	ND
20	Zinc (as Zn)	mg/l,Max	APHA 23 rd Ed,2017: 3111 B	5	BDL	BDL	BDL
21	Selenium (as Se)	mg/l,Max	APHA 23 rd Ed,2017: 3500 Se C	0.01	BDL	BDL	BDL
22	Mercury as (Hg)	mg/l,Max	APHA 23 rd Ed,2017: 3111 B	0.001	BDL	BDL	BDL
23	Cadmium as(Cd)	mg/l,Max	APHA 23 rd Ed,2017: 3111 B	0.003	BDL	BDL	BDL
24	Arsenic as (As)	mg/l,Max	APHA 23 rd Ed,2017: 3114 B	0.2	BDL	BDL	BDL
25	Cyanide as (CN-)	mg/l,Max	APHA 23 rd Ed,2017: 4500 CN ⁻ C,D	0.05	BDL	BDL	BDL
26	Lead as(Pb)	mg/l,Max	APHA 23 rd Ed,2017 3111 B	0.1	BDL	BDL	BDL
27	Total Coliform	MPN/100 ml	APHA 23 rd Ed,2017: 9221 B	Shall not be detectable in any 100 ml sample	ND	ND	ND
28PESTICIDES							
1	Endosulfan à	µg/l,Max	APHA 23rd edition: 6630 C	0.4	<0.005	<0.005	<0.005
2	Endosulfan ß	µg/l,Max	APHA 23rd edition: 6630 C	0.4	<0.005	<0.005	<0.005
3	Endosulfan sulphate	µg/l,Max	APHA 23rd edition: 6630 C	0.4	<0.005	<0.005	<0.005
4	Alachlor	µg/l, Max	APHA 23rd edition: 6630 C	20	<0.01	<0.01	<0.01
5	Atrazine	µg/l, Max	APHA 23rd edition: 6630 C	2.0	<0.01	<0.01	<0.01
6	Aldrin	µg/l, Max	APHA 23rd edition: 6630 C	0.03	<0.01	<0.01	<0.01
8	Alpha HCH	µg/l, Max	APHA 23rd edition: 6630 C	0.01	<0.01	<0.01	<0.01
9	Beta HCH	µg/l, Max	APHA 23rd edition: 6630 C	0.04	<0.01	<0.01	<0.01
10	Delta HCH	µg/l, Max	APHA 23rd edition: 6630 C	0.04	<0.01	<0.01	<0.01
11	Butachlor	µg/l, Max	APHA 23rd edition: 6630 C	125.0	<0.01	<0.01	<0.01
12	Chloropyriphos	µg/l, Max	APHA 23rd edition: 6630 C	30.0	<0.01	<0.01	<0.01
13	2,4-Dichlorophenoxyacetic acid	µg/l, Max	APHA 23rd edition: 6630 C	30.0	<0.05	<0.05	<0.05
14	p p DDE	µg/l, Max	APHA 23rd edition: 6630 C	1.0	<0.05	<0.05	<0.05
15	p p DDD	µg/l, Max	APHA 23rd edition: 6630 C	1.0	<0.05	<0.05	<0.05
16	p p DDT	µg/l, Max	APHA 23rd edition: 6630 C	1.0	<0.05	<0.05	<0.05
17	o p DDE	µg/l, Max	APHA 23rd edition: 6630 C	1.0	<0.05	<0.05	<0.05
18	o p DDD	µg/l, Max	APHA 23rd edition: 6630 C	1.0	<0.05	<0.05	<0.05
19	o p DDT	µg/l, Max	APHA 23rd edition: 6630 C	1.0	<0.05	<0.05	<0.05



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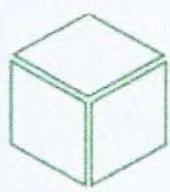
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• Quality Control & Project Management
• Renewable Energy

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• Information Technology
• Public Health Engineering

• Mine Planning & Design
• Mineral/Sub-Soil Exploration
• Waste Management Services

20	Ethion	µg/l, Max	APHA 23rd edition: 6630 C	3.0	<0.01	<0.01	<0.01
21	Lindane	µg/l, Max	APHA 23rd edition: 6630 C	2.0	<0.01	<0.01	<0.01
22	Isoproturon	µg/l, Max	APHA 23rd edition: 6630 C	9.0	<0.01	<0.01	<0.01
23	Malathion	µg/l, Max	APHA 23rd edition: 6630 C	190.0	<0.01	<0.01	<0.01
24	Methyl parathion	µg/l, Max	APHA 23rd edition: 6630 C	0.3	<0.01	<0.01	<0.01
25	Monocrotophos	µg/l, Max	APHA 23rd edition: 6630 C	1.0	<0.01	<0.01	<0.01
26	Phorate	µg/l, Max	APHA 23rd edition: 6630 C	2.0	<0.01	<0.01	<0.01





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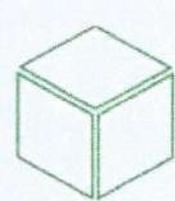
Ref. no: Envlab/22/R-1567

Date: 08.01.2023

GROUND WATER QUALITY ANALYSIS REPORT- DEC 2022

1. Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED , BHADRAK
2. Name of the Project : Kalarangiatta Chromite Mines , Kaliapani, Jajpur
3. Sampling Location : GW4: Tube Well at Kalarangiatta Village
GW5: Tube Well at Bhimta Nagar Village
4. Method of Sampling : APHA 1060 B
5. Date of Sampling : 21.12.2022
6. Date of Analysis : 22.12.2022 TO 28.12.2022
7. Sample Collected by : VCSPL Representative in presence of Client's Representative

Sl. No.	Parameter	Unit	TEST METHOD	Standard as per IS -10500:2012 Amended on 2015 & 2018	GW4	GW5
				Permissible Limit		
Physical Parameter						
1	Colour	Hazen,Max	APHA 23 rd Ed,2017 : 2120 B, C	5	<5	<5
2	Odour	--	APHA 23 rd Ed,2017 :2120 B	Agreeable	Agreeable	Agreeable
3	Taste	--	APHA 23 rd Ed,2017 : 2160 C	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU,Max	APHA 2130 B	1	0.7	0.8
5	pH at 25°C	--	APHA 23 rd Ed,2017 : 4500H ⁺ B	6.5-8.5	7.58	6.28
6	Dissolved Solids	mg/l,Max	APHA 23 rd Ed,2017 : 2540 C	500	312	278
CHEMICAL PARAMETER						
1	Total Hardness (as CaCO ₃)	mg/l,Max	APHA 23 rd Ed,2017 : 2340 C	200	184	193
2	Iron (as Fe)	mg/l,Max	APHA 23 rd Ed,2017 : 3111, B	1.0	0.53	0.45
3	Chloride (as Cl)	mg/l,Max	APHA 23 rd Ed,2017 : 4500Cl B	250	33	30
4	Residual, free Chlorine	mg/l,Min	APHA 4500 Cl B	0.2	ND	ND
5	Calcium (as Ca)	mg/l,Max	APHA 23 rd Ed,2017 : 3500Ca B	75	46.8	50.3
6	Magnesium (as Mg)	mg/l,Max	APHA 3500 Mg B	30	16.3	16.4
7	Copper (as Cu)	mg/l,Max	APHA 3111 B,C	0.05	BDL	BDL
8	Manganese (as Mn)	mg/l,Max	APHA 3500Mn B	0.1	BDL	BDL
9	Sulphate (as SO ₄)	mg/l,Max	APHA 4500 SO ₄ ²⁻ E	200	30.4	27.3
10	Nitrate (as NO ₃)	mg/l,Max	APHA 4500 NO ₃ ⁻ E	45	8.5	7.7
11	Fluoride (as F)	mg/l,Max	APHA 4500 F,C	1.0	0.29	0.25
12	Phenolic Compounds(as C ₆ H ₅ OH)	mg/l,Max	APHA 5530 B,D	0.001	BDL	BDL
13	Anionic Detergents (as MBAS)	mg/l,Max	APHA 5540 C	0.2	ND	ND
14	Chromium (as Cr ⁺⁶)	mg/l,Max	APHA 3500Cr B	0.05	<0.01	<0.01
15	Mineral Oil	mg/l,Max	APHA 5520 B	0.5	BDL	BDL
16	Alkalinity	mg/l,Max	APHA 2320 B	200	175	170
17	Aluminium as(Al)	mg/l,Max	APHA 3500Al B	0.03	BDL	BDL
18	Boron (as B)	mg/l,Max	APHA 4500 B,B	0.5	BDL	BDL
19	Polyaromatic hydrocarbons	mg/l,Max	APHA 23 rd Ed,2017	0.0001	ND	ND



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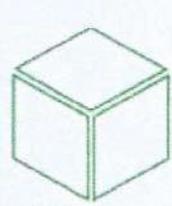
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• Renewable Energy

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• Information Technology
• Public Health Engineering

• Mine Planning & Design
• Mineral/Sub-Soil Exploration
• Waste Management Services

(PAH)						
20	Zinc (as Zn)	mg/l,Max	:6440 B APHA 23 rd Ed,2017: 3111 B	5	BDL	BDL
21	Selenium (as Se)	mg/l,Max	APHA 23 rd Ed,2017: 3500 Se C	0.01	BDL	BDL
22	Mercury as (Hg)	mg/l,Max	APHA 23 rd Ed,2017: 3111 B	0.001	BDL	BDL
23	Cadmium as(Cd)	mg/l,Max	APHA 23 rd Ed,2017: 3111 B	0.003	BDL	BDL
24	Arsenic as (As)	mg/l,Max	APHA 23 rd Ed,2017: 3114 B	0.2	BDL	BDL
25	Cyanide as (CN-)	mg/l,Max	APHA 23 rd Ed,2017: 4500 CN ⁻ C,D	0.05	BDL	BDL
26	Lead as(Pb)	mg/l,Max	APHA 23 rd Ed,2017 3111 B	0.1	BDL	BDL
27	Total Coliform	MPN/100 ml	APHA 23 rd Ed,2017: 9221 B	Shall not be detectable in any 100 ml sample	ND	ND
28PESTICIDES						
1	Endosulfan à	µg/l,Max	APHA 23rd edition: 6630 C	0.4	<0.005	<0.005
2	Endosulfan ß	µg/l,Max	APHA 23rd edition: 6630 C	0.4	<0.005	<0.005
3	Endosulfan sulphate	µg/l,Max	APHA 23rd edition: 6630 C	0.4	<0.005	<0.005
4	Alachlor	µg/l, Max	APHA 23rd edition: 6630 C	20	<0.01	<0.01
5	Atrazine	µg/l, Max	APHA 23rd edition: 6630 C	2.0	<0.01	<0.01
6	Aldrin	µg/l, Max	APHA 23rd edition: 6630 C	0.03	<0.01	<0.01
8	Alpha HCH	µg/l, Max	APHA 23rd edition: 6630 C	0.01	<0.01	<0.01
9	Beta HCH	µg/l, Max	APHA 23rd edition: 6630 C	0.04	<0.01	<0.01
10	Delta HCH	µg/l, Max	APHA 23rd edition: 6630 C	0.04	<0.01	<0.01
11	Butachlor	µg/l, Max	APHA 23rd edition: 6630 C	125.0	<0.01	<0.01
12	Chloropyriphos	µg/l, Max	APHA 23rd edition: 6630 C	30.0	<0.01	<0.01
13	2,4-Dichlorophenoxyacetic acid	µg/l, Max	APHA 23rd edition: 6630 C	30.0	<0.05	<0.05
14	p p DDE	µg/l, Max	APHA 23rd edition: 6630 C	1.0	<0.05	<0.05
15	p p DDD	µg/l, Max	APHA 23rd edition: 6630 C	1.0	<0.05	<0.05
16	p p DDT	µg/l, Max	APHA 23rd edition: 6630 C	1.0	<0.05	<0.05
17	o p DDE	µg/l, Max	APHA 23rd edition: 6630 C	1.0	<0.05	<0.05
18	o p DDD	µg/l, Max	APHA 23rd edition: 6630 C	1.0	<0.05	<0.05
19	o p DDT	µg/l, Max	APHA 23rd edition: 6630 C	1.0	<0.05	<0.05
20	Ethion	µg/l, Max	APHA 23rd edition: 6630 C	3.0	<0.01	<0.01
21	Lindane	µg/l, Max	APHA 23rd edition: 6630 C	2.0	<0.01	<0.01



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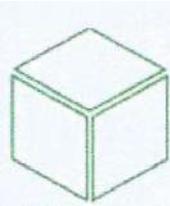
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- Waste Management Services

22	Isoproturon	µg/l, Max	APHA 23rd edition: 6630 C	9.0	<0.01	<0.01
23	Malathion	µg/l, Max	APHA 23rd edition: 6630 C	190.0	<0.01	<0.01
24	Methyl parathion	µg/l, Max	APHA 23rd edition: 6630 C	0.3	<0.01	<0.01
25	Monocrotophos	µg/l, Max	APHA 23rd edition: 6630 C	1.0	<0.01	<0.01
26	Phorate	µg/l, Max	APHA 23rd edition: 6630 C	2.0	<0.01	<0.01





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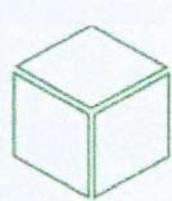
Ref. no: Envlab/22/R-1568

Date :08.01.2023

EFFLUENT WATER DISCHARGE ANALYSIS REPORT- DEC 2022

1. Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED , BHADRAK
2. Name of the Project : KALARANGIATTA CHROMITE MINES , KALIAPANI, JAJPUR
3. Sampling Location : EW1: ETP Mines Final Discharge Water
4. Method of Sampling : APHA 1060 B
5. Date of Sampling : 21.12.2022
6. Date of Analysis : 22.12.2022 to 28.12.2022
7. Sample Collected by : VCSPL Representative in presence of Client's Representative

Sl. No.	Parameters	Testing Methods	Unit	Standards (In land Surface water)	Analysis Results
					EW-1
1	Colour	Visual Comparison Method APHA 2120 B; 23 rd Edition, 2017	Hazen	Colourless	10
2	Odour	Threshold Odour Method APHA 2150 B; 23 rd Edition, 2017	--	Odourless	pungent smell
3	pH at 25°C	pH Meter APHA 4500 H ⁺ B; 23 rd Edition, 2017	--	5.5-9.0	8.72
4	Total Suspended Solids	Gravimetric Method APHA 2540 D; 23 rd Edition, 2017	mg/l	100	55
5	Copper as Cu	By AAS Method APHA 3111 B; 23 rd Edition, 2017	mg/l	3	BDL
6	Fluoride as F	Distillation followed by Spectrophotometric Method APHA 4500 F C,D; 23 rd Edition, 2017	mg/l	2	0.47
7	Total Residual Chlorine	Iodometric Method APHA 23RD Ed,2017 : 4500Cl, B	mg/l	1	0.29
8	Iron as Fe	By AAS Method APHA 3111 B; 23 rd Edition, 2017	mg/l	3	0.69
9	Manganese as Mn	By AAS Method APHA 3111 B; 23 rd Edition, 2017	mg/l	2	BDL
10	Nitrate as NO ₃	By UV-Screen Method APHA 4500 NO ₃ B; 23 rd Edition, 2017	mg/l	10	8.6
11	Phenolic Compounds as C ₆ H ₅ OH	Distillation Followed by Spectrophotometric Method APHA 5530-B, D; 23 rd Edition, 2017	mg/l	1	BDL
12	Selenium as Se	By AAS Method APHA 3500 Se C; 23 rd Edition, 2017	mg/l	0.05	BDL
13	Cadmium as Cd	By AAS Method APHA 3111 B; 23 rd Edition, 2017	mg/l	2.0	BDL
14	Cyanide as CN	Distillation Followed by Spectrophotometric Method APHA 4500 -CN-C,E; 23 rd Edition, 2017	mg/l	0.2	BDL
15	Lead as Pb	By AAS Method APHA 3111 B; 23 rd Edition, 2017	mg/l	0.1	BDL
16	Mercury as Hg	By AAS Method APHA 3112 B; 23 rd Edition, 2017	mg/l	0.01	BDL
17	Nickel as Ni	By AAS Method APHA 3111 B; 23 rd Edition, 2017	mg/l	3	BDL
18	Arsenic as As	By AAS Method APHA 3114 B; 23 rd Edition, 2017	mg/l	0.2	BDL
19	Total Chromium as Cr	By AAS Method APHA 3111 B; 23 rd Edition, 2017	mg/l	2	0.39
20	Zinc as Zn	By AAS Method APHA 3111 B; 23 rd Edition, 2017	mg/l	5	0.053
21	Hexavalent Chromium as Cr ⁶⁺	By AAS Method APHA 3500 Cr B; 23 rd Edition, 2017	mg/l	0.05	<0.01
22	Vanadium as V	By AAS Method APHA 3500 V; 23 rd Edition, 2017	mg/l	0.2	BDL



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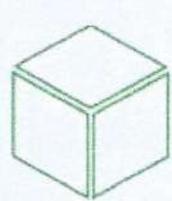
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- Environmental & Social Study
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- Public Health Engineering
- Waste Management Services

23	Temperature	By Thermometer APHA 2550 B; 23 rd Edition, 2017	°C	Shall not exceed 5 ^o C above the receiving water temperature	36
24	Dissolved Oxygen	Modified Winkler Method APHA 4500 O. C; 23 rd Edition, 2017	mg/l	--	7.2
25	Biochemical Oxygen Demand as BOD	Oxygen Depletion Method IS 3025 (Part 44):2003	mg/l	30	6.4
26	Chemical Oxygen Demand as COD	Open Reflux Method APHA 5220 B; 23 rd Edition, 2017	mg/l	250	20
27	Oil & Grease	Gravimetric Method (Solvent Extraction) APHA 5520 B; 23 rd Edition, 2017	mg/l	10	6.7
28	Ammonical Nitrogen as N	By TKN Method APHA 4500-NH ₃ C; 23 rd Edition, 2017	mg/l	50	3.8
29	Total Kjeldahl Nitrogen as N	By TKN Method APHA 4500-N _{org} C; 23 rd Edition, 2017	mg/l	100	8.0
30	Sulphide as S	By Methylene Blue Method APHA 4500-S D; 23 rd Edition, 2017	mg/l	2	BDL
31	Free Ammonia as NH ₃	By Calculation	mg/l	10	7.3
32	Particulate Size of Suspended Solids	Gravimetric Method APHA 2540 D; 23 rd Edition, 2017	μ	Shall pass 850 micron IS Sieve	<850
33	Bio-assay Test	Evaluating Acute Toxicity IS 6582 (P-2) 2008	%	90% survival of fish after 96 hours in 100% effluent	98% Survival of Fish after 96 Hrs in 100% Effluent

CL – Colorless, ND – Not detected.

BDL (Below detection limit) Values : (Cu<0.02 mg/l, Mn<0.025 mg/l, C₆H₅OH<0.05mg/l, Hg<0.004mg/l, Cd<0.01 mg/l, Se<0.001 mg/l, As<0.004 mg/l, Pb<0.02 mg/l, Zn<0.65 mg/l, Cr⁶⁺<0.01 mg/l, Al<0.1 mg/l, B<0.1 mg/l, NO₃<1 mg/l)





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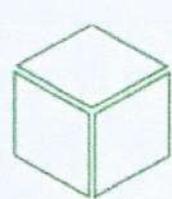
Ref : Envlab/22/R-1569

Date :08.01.2023

EFFLUENT WATER DISCHARGE ANALYSIS REPORT-DEC 2022

1. Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED , BHADRAK
2. Name of the Project : KALARANGIATTA CHROMITE MINES , KALIAPANI, JAJPUR
3. Sampling Location : EW1: ETP INLET
4. Method of Sampling : APHA 1060 B
5. Date of Sampling : 21.12.2022
6. Date of Analysis :22.12.2022 to 28.12.2022
7. Sample Collected by : VCSPL Representative in presence of Client's Representative

Sl. No.	Parameters	Testing Methods	Unit	Analysis Results
				EW-1
1	Colour	Visual Comparison Method APHA 2120 B; 23 rd Edition, 2017	Hazen	15
2	Odour	Threshold Odour Method APHA 2150 B; 23 rd Edition, 2017	--	pungent smell
3	pH at 25°C	pH Meter APHA 4500 H'B; 23 rd Edition, 2017	--	11.6
4	Total Suspended Solids	Gravimetric Method APHA 2540 D; 23 rd Edition, 2017	mg/l	68
5	Copper as Cu	By AAS Method APHA 3111 B; 23 rd Edition, 2017	mg/l	BDL
6	Fluoride as F	Distillation followed by Spectrophotometric Method APHA 4500 F C,D; 23 rd Edition, 2017	mg/l	0.70
7	Total Residual Chlorine	Iodometric Method APHA 23RD Ed,2017 : 4500CL, B	mg/l	ND
8	Iron as Fe	By AAS Method APHA 3111 B; 23 rd Edition, 2017	mg/l	1.57
9	Manganese as Mn	By AAS Method APHA 3111 B; 23 rd Edition, 2017	mg/l	BDL
10	Nitrate as NO ₃	By UV-Screen Method APHA 4500 NO ₃ B; 23 rd Edition, 2017	mg/l	15.8
11	Phenolic Compounds as C ₆ H ₅ OH	Distillation Followed by Spectrophotometric Method APHA 5530-B, D; 23 rd Edition, 2017	mg/l	BDL
12	Selenium as Se	By AAS Method APHA 3500 Se C; 23 rd Edition, 2017	mg/l	BDL
13	Cadmium as Cd	By AAS Method APHA 3111 B; 23 rd Edition, 2017	mg/l	BDL
14	Cyanide as CN	Distillation Followed by Spectrophotometric Method APHA 4500 -CN-C,E; 23 rd Edition, 2017	mg/l	BDL
15	Lead as Pb	By AAS Method APHA 3111 B; 23 rd Edition, 2017	mg/l	BDL
16	Mercury as Hg	By AAS Method APHA 3112 B; 23 rd Edition, 2017	mg/l	BDL
17	Nickel as Ni	By AAS Method APHA 3111 B; 23 rd Edition, 2017	mg/l	BDL
18	Arsenic as As	By AAS Method APHA 3114 B; 23 rd Edition, 2017	mg/l	BDL
19	Total Chromium as Cr	By AAS Method APHA 3111 B; 23 rd Edition, 2017	mg/l	1.48
20	Zinc as Zn	By AAS Method APHA 3111 B; 23 rd Edition, 2017	mg/l	0.51
21	Hexavalent Chromium as Cr ⁺⁶	By AAS Method APHA 3500 Cr B; 23 rd Edition, 2017	mg/l	0.77
22	Vanadium as V	By AAS Method APHA 3500 V; 23 rd Edition, 2017	mg/l	BDL



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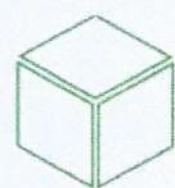
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23	Temperature	By Thermometer APHA 2550 B; 23 rd Edition, 2017	°C	38
24	Dissolved Oxygen	Modified Winkler Method APHA 4500 O. C; 23 rd Edition, 2017	mg/l	6.9
25	Biochemical Oxygen Demand as BOD	Oxygen Depletion Method IS 3025 (Part 44):2003	mg/l	9.7
26	Chemical Oxygen Demand as COD	Open Reflux Method APHA 5220 B; 23 rd Edition, 2017	mg/l	280
27	Oil & Grease	Gravimetric Method (Solvent Extraction) APHA 5520 B; 23 rd Edition, 2017	mg/l	13.3
28	Ammonical Nitrogen as N	By TKN Method APHA 4500-NH ₃ C; 23 rd Edition, 2017	mg/l	8.6
29	Total Kjeldahl Nitrogen as N	By TKN Method APHA 4500-N _{org} C; 23 rd Edition, 2017	mg/l	12.8
30	Sulphide as S	By Methylene Blue Method APHA 4500-S D; 23 rd Edition, 2017	mg/l	BDL
31	Free Ammonia as NH ₃	By Calculation	mg/l	7.35
32	Particulate Size of Suspended Solids	Gravimetric Method APHA 2540 D; 23 rd Edition, 2017	μ	<850
33	Bio-assay Test	Evaluating Acute Toxicity IS 6582 (P-2) 2008	%	No Survival of Fish after 96 Hrs in 100 % Effluent

CL - Colorless, ND - Not detected.

BDL (Below detection limit) Values : (Cu<0.02 mg/l, Mn<0.025 mg/l, C₆H₅OH<0.05mg/l, Hg<0.004mg/l, Cd<0.01 mg/l, Se<0.001 mg/l, As<0.004 mg/l, Pb<0.02 mg/l, Zn<0.65 mg/l, Cr⁶⁺<0.01 mg/l, Al<0.1 mg/l, B<0.1 mg/l, NO₃<1 mg/l)





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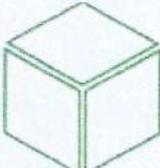
Ref : Envlab/22/R-1570

Date : 08.01.2023

SURFACE WATER QUALITY ANALYSIS REPORT- DEC-2022

- Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED , BHADRAK
- Name of the Project : KALARANGIATTA CHROMITE MINES , KALIAPANI, JAJPUR
- Sampling Location : SW1: Damsala Nallah Upstream Water (100 mtr Up)
SW2: Damsala Nallah Downstream Water (100 mtr Down)
(with impact of other mines discharge)
- Method of Sampling : APHA 1060 B
- Date of Sampling : 21.12.2022
- Date of Analysis : 22.12.2022 to 28.12.2022
- Sample Collected by : VCSPL Representative in presence of Client's Representative

Sl. No	Parameter	Testing Method	Unit	Standards as per IS-2296:1992 Class -'C'	Analysis Results	
					SW-1	SW-2
1	Colour (max)	Visual Comparison Method APHA 23 RD Ed.2017 : 2120 B, C	Hazen	300	<5	5
2	pH Value	pH Meter APHA 23 RD Ed.2017 : 4500H ⁺ B	--	6.0-9.0	7.31	7.33
3	Suspended solids	Gravimetric Method APHA 23 RD Ed.2017 : 2540 D	mg/l	--	77	82
4	Dissolved Oxygen (minimum)	Modified Winkler Method APHA 23 RD Ed.2017 : 2540 C	mg/l	4.0	7.1	6.4
5	Turbidity	Nephelometric Method APHA 23 RD Ed.2017: 2130 B	NTU	--	3.1	4.2
6	Chloride (max)	Titrimetric Method APHA 23 RD Ed.2017: 4500Cl ⁻ B	mg/l	600	12	15
7	Total Dissolved Solids	Gravimetric Method APHA 23 RD Ed.2017: 2540 C	mg/l	1500	99	129
8	BOD (3) days at 27°C (max)	IS 3025(P-44) : 1993 RA 2003	mg/l	3.0	BDL	BDL
9	Arsenic as As	By AAS Method APHA 23 RD Ed.2017: 3114 B	mg/l	0.2	BDL	BDL
10	Lead as Pb(max)	By AAS Method APHA 23 RD Ed.2017 3111 B	mg/l	0.1	BDL	BDL
11	Cadmium as Cd (max)	By AAS Method APHA 23 RD Ed 2017: 3111 B	mg/l	0.01	BDL	BDL
12	Hexa Chromium as Cr ⁺⁶	Diphenyl Carbazide Method APHA 23 RD Ed.2017: 3500Cr B	mg/l	0.05	<0.01	<0.01
13	Copper as Cu (max)	By AAS Method APHA 23 RD Ed.2017: 3111 B	mg/l	1.5	BDL	BDL
14	Zinc as Zn(max)	By AAS Method APHA 23 RD Ed.2017: 3111 B	mg/l	15	BDL	BDL
15	Selenium as Se (max)	By AAS Method APHA 23 RD Ed.2017: 3500 Se C	mg/l	0.05	BDL	BDL
16	Cyanide as CN (max)	Distillation followed by Spectrophotometric Method APHA 23 RD Ed.2017: 4500	mg/l	0.05	BDL	BDL
17	Fluoride as F (max)	Distillation followed by Spectrophotometric Method APHA 23 RD Ed.2017: 4500F ⁻ C	mg/l	1.5	0.24	0.29
18	Sulphates (SO ₄) (max)	Turbidimetric Method APHA 23 RD Ed.2017: 4500 SO ₄ ²⁻ E	mg/l	400	0.97	0.99
19	Phenolic Compounds as C ₆ H ₅ OH (max)	Chloroform Extraction By Colorimetric Method APHA 23 RD Ed.2017: 5530 B,D	mg/l	0.005	BDL	BDL



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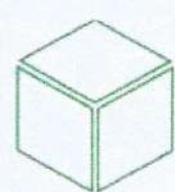
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20	Iron as Fe (max)	By AAS Method APHA 23 RD Ed,2017: 3500Fe, B	mg/l	0.5	0.73	0.063
21	Nitrate as NO ₃ (max)	By UV-Screen Method APHA 23 RD Ed,2017: 4500 NO ₃ ⁻ E	mg/l	50	3.3	3.8
22	Anionic Detergents (max)	Anionic Surfactants as MBAS APHA 23 RD Ed,2017: 5540 C	mg/l	1.0	ND	ND
23	Total Coli form	By Multiple Tube Fermentation Technique APHA 23 RD Ed,2017: 9221 B	MPN/ 100 ml	5000	920	1600

CL – Colorless, ND – Not detected.

BDL (Below detection limit) Values : (Cu<0.02 mg/l , Mn<0.025 mg/l, C₆H₅OH<0.05mg/l, Hg<0.004mg/l, Cd<0.01 mg/l ,Se<0.001 mg/l, As<0.004 mg/l,Pb<0.02 mg/l, Zn<0.65 mg/l, Cr⁺⁶<0.01 mg/l, Al<0.1 mg/l , B<0.1 mg/l, NO₃<1 mg/l)





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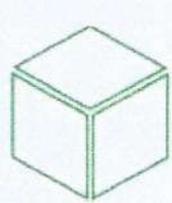
Date : 08.01.2023

MEASUREMENT OF GROUND WATER QUALITY ANALYSIS REPORT DEC-2022

1. Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED , BHADRAK
2. Name of the Project : KALARANGIATTA CHROMITE MINES , KALIAPANI, JAJPUR
3. Sampling Location : GW1: Tube Well Near TISCO Main Gate
GW2: Tube Well inside the Lease hold Area
GW3: Open Well at Ransol Village
GW4: Tube Well at Kalarangiatta Village
GW5: Tube Well at Bhimta Nagar Village
4. Method of Sampling : APHA 1060 B
5. Date of Analysis : 22.12.2022
6. Sample Collected by : VCSPL Representative in presence of Client's Representative

Sl. No.	Parameter	Testing Method	Unit	Standard as per IS -10500:2012 Amended on 2015 & 2018		Analysis Result				
				Acceptable Limit	Permissible Limit	GW1	GW2	GW3	GW4	GW5
						DOS:22.10.2022	DOS:22.09.2022	DOS:22.09.2022	DOS:22.09.2022	DOS:22.09.2022
1	Hexavalent Chromium as Cr ⁶⁺	By AAS Method APHA 23 RD Ed,2017: 3500 Cr B	mg/l	--	--	<0.01	<0.01	<0.01	<0.01	<0.01





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Date : 08.01.2023

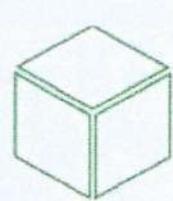
SOIL QUALITY ANALYSIS REPORT- DEC 2022

- Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED , BHADRAK
- Name of the Project : KALARANGIATTA CHROMITE MINES , KALIAPANI, JAJPUR
- Sampling Location : S1 : Near Ore Plot Area
S2 : Near Truck Parking Area
S3 : Near Dump Area
S4 : Near Lease Hold Area
- Date of Sampling : 21.12.2022
- Date of Analysis : 22.12.2022 to 28.12.2022
- Sample Collected by : VCSPL Representative in presence of Client's Representative

Sl. No.	Name of the Parameters	Unit	Testing Method	Analysis Result			
				S1	S2	S3	S4
1	Mercury as Hg	mg/kg	EPA 3050B, 7000B Rev 02, 1996	ND	ND	ND	ND
2	Nickel as Ni	mg/kg	EPA 3050B, 7000B Rev 02, 1996	ND	ND	ND	ND
3	Cobalt as CO	mg/kg	EPA 3050B, 7000B Rev 02, 1996	ND	ND	ND	ND
4	Arsenic as As	mg/kg	EPA 3050B, 7000B Rev 02, 1996	ND	ND	ND	ND

BDL Value : Ni <50 mg/kg, CO < 10 mg/kg, As < 10 mg/kg, Hg <10 mg/kg





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Ref : Envlab/22/R-1573

Date : 08.01.2023

NOISE QUALITY ANALYSIS REPORT- DEC 2022

1. Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED , BHADRAK
2. Name of the Project : KALARANGIATTA CHROMITE MINES , KALIAPANI, JAJPUR
3. Date of Sampling : 21.12.2022
4. Sample Collected by : VCSPL Representative in presence of Client's Representative

Location ID	Location		Result in dB (A)	
			Day Time (6.00 am to 10.00pm)	Night Time (10.00pm to 6.00 am)
N1	Near Middle of the Quarry	Ambient	65.1	60.1
N2	Near Office Building		60.7	56.2
N3	At project site		61.9	59.1
N4	Near main gate		65.5	59.3
N5	Near Chromite Quarry colony		58.9	54.7
N6	Near Bhimtangar Chromite colony		59.8	54.1
N7	Near Kaliapani bus stand		56.3	53.3
N8	At Kalarangi Village		57.2	51.5
N9	At Godisahi village		57.7	49.6
N10	At Chadeiragada village		58.2	50.4
N11	Naer to TATA hospital area		55.9	51.2
N12	At Tarini market, TATA mines chhak		61.4	52.7
N13	Near Ransol Village		56.7	52.1

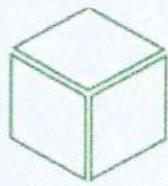
AMBIENT NOISE LEVEL STANDARD

Category Area/Zone	Limit in dB (A)	
	Day Time (6.00 am to 10.00pm)	Night Time (10.00pm to 6.00 am)
Industrial Area	75	70
Residential Area	55	45
Commercial Area	65	55
Silence Zone	50	40



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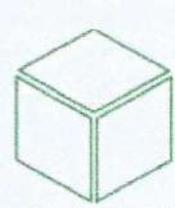
Date : 08.01.2023

GROUND WATER LEVEL REPORT- DEC 2022

1. Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED , BHADRAK
2. Name of the Project : KALARANGIATTA CHROMITE MINES , KALIAPANI, JAJPUR
3. Sample Collected by : VCSPL Representative in presence of Client's Representative

SL.No.	Locations	DOS	Unit	Analysis Result
1	Tube Well Water Near TISCO Main Gate	21.12.2022	mt/bgl	8.3
2	Tube Well Inside the Lease Hold Area	21.12.2022	mt/bgl	7.8
3	Open Well Water of Ransol	21.12.2022	mt/bgl	8.5
4	Tube Well Water of Kalarangiatta	21.12.2022	mt/bgl	7.2
5	Tube Well Water of Bhimtanagar	21.12.2022	mt/bgl	7.4
6	Open Well Village Goramian	21.12.2022	mt/bgl	7.6
7	Tube Well Near OMC Labour Colony	21.12.2022	mt/bgl	7.8
8	Open Well at Village Chingudipal	21.12.2022	mt/bgl	8.1
9	Open Well at Village Kusumundia	21.12.2022	mt/bgl	8.5





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Ref : Envlab/22/R-1575

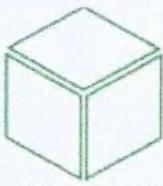
Date : 08.01.2023

FUGITIVE EMISSION ANALYSIS REPORT- DEC 2022

1. Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED , BHADRAK
2. Name of the Project : KALARANGIATTA CHROMITE MINES , KALIAPANI, JAJPUR
3. Sampling Location : F1- Near Mines Ore Plot Area
F2- Near Office
4. Method of Sampling : IS 5182(P-5) 1975 RA 2014
5. Date of Sampling : 21.12.2022
6. Date of Analysis : 22.12.2022 to 28.12.2022
7. Sample Collected by : VCSPL Representative in presence of Client's Representative

SL. No.	Test Parameters	Test Method	Unit	Analysis Result	
				F1	F2
1	Suspended Particulate Matter as SPM	IS 5182 (P-4)1999 RA 2014 Gravimetric Method	$\mu\text{g}/\text{m}^3$	246	313





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Ref : Envlab/22/R- 1576

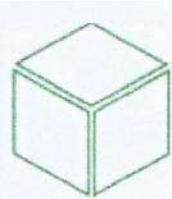
Date : 08.01.2023

DUSTFALL ANALYSIS REPORT- DEC 2022

1. Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED , BHADRAK
2. Name of the Project : KALARANGIATTA CHROMITE MINES , KALIAPANI, JAJPUR
3. Sampling Location : DF1- Near Roof Top of Office Building
4. Date of Sampling : 21.12.2022
5. Sample Collected by : VCSPL Representative in presence of Client's Representative

SL.No.	Parameters	Unit (mg of deposit per square meter per day)	Analysis Result
			DF1
1	Mercury as Hg	mg/m ² d	ND
2	Nickel as Ni	mg/m ² d	ND
3	Cobalt as CO	mg/m ² d	ND
4	Arsenic as As	mg/m ² d	ND





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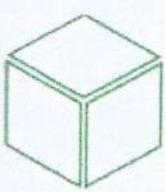
Ref. no: Envlab/22/R-1577

Date: 08.01.2023

GROUND WATER QUALITY ANALYSIS REPORT- DEC 2022

- Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED , BHADRAK
- Name of the Project : Kalarangiata Chromite Mines,Kaliapani,Jajpur
- Sampling Location : DW1: Canteen
- Method of Sampling : APHA 1060 B
- Date of Sampling : 21.12.2022
- Date of Analysis : 22.12.2022 TO 28.12.2022
- Sample Collected by : VCSPL Representative in presence of Client's Representative

Sl. No.	Parameter	Unit	TEST METHOD	Standard as per IS -10500:2012 Amended on 2015 & 2018	DW1
				Permissible Limit	
Physical Parameter					
1	Colour	Hazen,Max	APHA 23 rd Ed,2017 : 2120 B, C	5	<5
2	Odour	--	APHA 23 rd Ed,2017 :2120 B	Agreeable	Agreeable
3	Taste	--	APHA 23 rd Ed,2017 : 2160 C	Agreeable	Agreeable
4	Turbidity	NTU,Max	APHA 2130 B	1	0.7
5	pH at 25°C	--	APHA 23 rd Ed,2017 : 4500H ⁺ B	6.5-8.5	7.31
6	Dissolved Solids	mg/l,Max	APHA 23 rd Ed,2017 : 2540 C	500	264
CHEMICAL PARAMETER					
1	Total Hardness (as CaCO ₃)	mg/l,Max	APHA 23 rd Ed,2017 : 2340 C	200	172
2	Iron (as Fe)	mg/l,Max	APHA 23 rd Ed,2017 : 3111, B	1.0	0.58
3	Chloride (as Cl)	mg/l,Max	APHA 23 rd Ed,2017 : 4500Cl B	250	30
4	Residual, free Chlorine	mg/l,Min	APHA 4500 Cl B	0.2	ND
5	Calcium (as Ca)	mg/l,Max	APHA 23 rd Ed,2017 : 3500Ca B	75	41.5
6	Magnesium (as Mg)	mg/l,Max	APHA 3500 Mg B	30	16.6
7	Copper (as Cu)	mg/l,Max	APHA 3111 B,C	0.05	BDL
8	Manganese (as Mn)	mg/l,Max	APHA 3500Mn B	0.1	BDL
9	Sulphate (as SO ₄)	mg/l,Max	APHA 4500 SO ₄ ²⁻ E	200	26.7
10	Nitrate (as NO ₃)	mg/l,Max	APHA 4500 NO ₃ ⁻ E	45	5.7
11	Fluoride (as F)	mg/l,Max	APHA 4500 F,C	1.0	0.22
12	Phenolic Compounds(as C ₆ H ₅ OH)	mg/l,Max	APHA 5530 B,D	0.001	BDL
13	Anionic Detergents (as MBAS)	mg/l,Max	APHA 5540 C	0.2	ND
14	Chromium (as Cr ⁺⁶)	mg/l,Max	APHA 3500Cr B	0.05	<0.01
15	Mineral Oil	mg/l,Max	APHA 5520 B	0.5	BDL
16	Alkalinity	mg/l,Max	APHA 2320 B	200	145
17	Aluminium as(Al)	mg/l,Max	APHA 3500Al B	0.03	BDL



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18	Boron (as B)	mg/l,Max	APHA 4500 B,B	0.5	BDL
19	Polyaromatic hydrocarbons (PAH)	mg/l,Max	APHA 23 rd Ed,2017 :6440 B	0.0001	ND
20	Zinc (as Zn)	mg/l,Max	APHA 23 rd Ed,2017: 3111 B	5	BDL
21	Selenium (as Se)	mg/l,Max	APHA 23 rd Ed,2017: 3500 Se C	0.01	BDL
22	Mercury as (Hg)	mg/l,Max	APHA 23 rd Ed,2017: 3111 B	0.001	BDL
23	Cadmium as(Cd)	mg/l,Max	APHA 23 rd Ed,2017: 3111 B	0.003	BDL
24	Arsenic as (As)	mg/l,Max	APHA 23 rd Ed,2017: 3114 B	0.2	BDL
25	Cyanide as (CN-)	mg/l,Max	APHA 23 rd Ed,2017: 4500 CN C,D	0.05	BDL
26	Lead as(Pb)	mg/l,Max	APHA 23 rd Ed,2017 3111 B	0.1	BDL
27	Total Coliform	MPN/100 ml	APHA 23 rd Ed,2017: 9221 B	Shall not be detectable in any 100 ml sample	ND

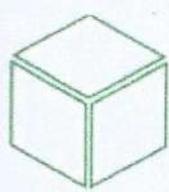
PESTICIDES

1	Endosulfan à	µg/l,Max	APHA 23rd edition: 6630 C	0.4	<0.005
2	Endosulfan ß	µg/l,Max	APHA 23rd edition: 6630 C	0.4	<0.005
3	Endosulfan sulphate	µg/l,Max	APHA 23rd edition: 6630 C	0.4	<0.005
4	Alachlor	µg/l, Max	APHA 23rd edition: 6630 C	20	<0.01
5	Atrazine	µg/l, Max	APHA 23rd edition: 6630 C	2.0	<0.01
6	Aldrin	µg/l, Max	APHA 23rd edition: 6630 C	0.03	<0.01
8	Alpha HCH	µg/l, Max	APHA 23rd edition: 6630 C	0.01	<0.01
9	Beta HCH	µg/l, Max	APHA 23rd edition: 6630 C	0.04	<0.01
10	Delta HCH	µg/l, Max	APHA 23rd edition: 6630 C	0.04	<0.01
11	Butachlor	µg/l, Max	APHA 23rd edition: 6630 C	125.0	<0.01
12	Chloropyriphos	µg/l, Max	APHA 23rd edition: 6630 C	30.0	<0.01
13	2,4-Dichlorophenoxyacetic acid	µg/l, Max	APHA 23rd edition: 6630 C	30.0	<0.05
14	p p DDE	µg/l, Max	APHA 23rd edition: 6630 C	1.0	<0.05
15	p p DDD	µg/l, Max	APHA 23rd edition: 6630 C	1.0	<0.05
16	p p DDT	µg/l, Max	APHA 23rd edition: 6630 C	1.0	<0.05
17	o p DDE	µg/l, Max	APHA 23rd edition: 6630 C	1.0	<0.05
18	o p DDD	µg/l, Max	APHA 23rd edition: 6630 C	1.0	<0.05
19	o p DDT	µg/l, Max	APHA 23rd edition: 6630 C	1.0	<0.05

Plot No.- M-22 & 23, Chandaka Industrial Estate, Patia, Bhubaneswar, Khurda, Odisha-751024, India Tel.: 0674-3511721

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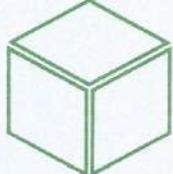
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20	Ethion	µg/l, Max	APHA 23rd edition: 6630 C	3.0	<0.01
21	Lindane	µg/l, Max	APHA 23rd edition: 6630 C	2.0	<0.01
22	Isoproturon	µg/l, Max	APHA 23rd edition: 6630 C	9.0	<0.01
23	Malathion	µg/l, Max	APHA 23rd edition: 6630 C	190.0	<0.01
24	Methyl parathion	µg/l, Max	APHA 23rd edition: 6630 C	0.3	<0.01
25	Monocrotophos	µg/l, Max	APHA 23rd edition: 6630 C	1.0	<0.01
26	Phorate	µg/l, Max	APHA 23rd edition: 6630 C	2.0	<0.01





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Ref : Envlab/22/R-1578

Date : 08.01.2023

STP WATER QUALITY ANALYSIS REPORT- DEC 2022

Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED , BHADRAK

Name of the Project : KALARANGIATA CHROMITE MINES , KALIAPANI, JAJPUR

Sampling Location: W1: 20 KLD STP Near Nursery

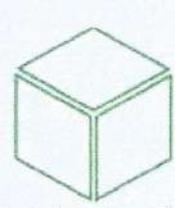
Method of Sampling: APHA 1060 B

Date of Sampling: 21.12.2022

Date of Analysis: 22.12.2022 to 28.12.2022

SL. NO	PARAMETERS	Unit of Measurement	Method of Testing	MOEF & CC Standard Dt:13.10.2017	RESULT
					W1
1	pH Value (at 25°C)	--	APHA 4500H ^B	6.5-9.0	6.9
2	Suspended Solids	mg/l	APHA 2540 D	<100	73
3	Oil & Grease	mg/l	APHA 5520 B	--	4.0
4	BOD(3) days at 27°C	mg/l	APHA 5210 B	30	8.0
5	COD	mg/l	APHA 5220 C	--	14.0
6	Total Chromium (as Cr)	mg/l	APHA 3111 B	--	<0.01
7	Faecal Coliform	MPN/100ml	APHA 9221 E	<1000	26





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Ref : Envlab/22/R- 1579

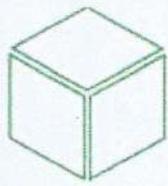
Date : 08.01.2023

STP MBBR BASIN WATER QUALITY ANALYSIS REPORT- DEC 2022

Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED , BHADRAK
Name of the Project : KALRANGIATTA CHROMITE MINES , KALIAPANI, JAJPUR
Sampling Location: : W1: MBBR BASIN 20 KLD STP Near Nursery
Method of Sampling: APHA 1060 B
Date of Sampling: 21.12.2022
Date of Analysis: 22.12.2022 to 26.12.2022

SL.NO.	Parameters	Unit of Measurement	Standard Operating Range	W1
1	pH Value (at 25°C)	--	6.5-8.0	6.93
2	MLSS	mg/l	2300-2500	2338
3	MLVSS	mg/l	2700-3200	2795
4	DO	mg/l	1.0-2.0	1.5





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Ref : Envlab/22/R- 1580

Date : 08.01.2023

Silica Content in AAQ

Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED , BHADRAK

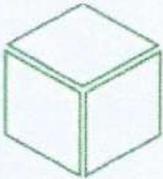
Name of the Project : Kalarangiatta Chromite Mines , Kaliapani, Jajpur

Sample Collected By : VCSPL representative in presence of Client's representative

Sl. No.	Date of monitoring	Sampler attached to person	Personal Respirable Dust (mg/m ³)	Respirable free Silica (%)
1	20.12.2022	Nalmohan Sardar	0.55	2.2
2	20.12.2022	Sarla Mohanta	0.63	2.5
3	20.12.2022	Suresh Mahanta	0.70	2.1
4	20.12.2022	Gopi Tingua	0.69	2.5

DGMS Standards: Average concentration during each shift 3 mg/m³ where free silica in air borne dust is 5% or less.





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Ref : Envlab/22/R-1581

Date : 08.01.2023

SOURCE EMISSION ANALYSIS REPORT-DECEMBER 2022

Name & Address of the Client: Kalarangiata Chromite Mines (M/S Ferro Alloys Corporation Limited),
Sukinda, Jajpur

Sample Type : Stack Sample

Date of Sampling : 20.12.2022

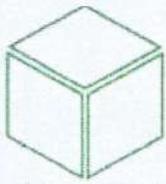
Date of Analysis : 21.12.2022 to 26.12.2022

Sampling Done by : VISIONTEK CONSULTANCY SERVICE PVT LTD

Sl.No.	Parameters	Stack-1 COB DG I	CPCB Standard for DG ≥ 800KW (≥ 1000KVA)
		Capacity: 15 KVA	
1	Stack °C	174	--
2	Stack Velocity m/sec	14.91	--
3	Particulate Matter (PM), mg/Nm ³	55	75 g/Nm ³
4	Oxides of Nitrogen (NOx), ppm	46	710 ppm
5	Carbon Monoxide, mg/Nm ³	40.7	150 mg/Nm ³
6	Non Methyl Hydro Carbon as C, mg/Nm ³	20.5	100 mg/Nm ³

The results stated in the test report are refer only to the sample tested. Test report shall not be reproduced in full without written approval of the Company





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Ref : Envlab/22/R-1582

Date :08.01.2023

HAZARDOUS WASTE ANALYSIS REPORT

Name of Client : M/s FERRO ALLOYS CORPORATION LIMITED , BHADRAK

Name of the Sample : S1:Used Oil of Kalarangiatta Chromite Mines

Date of Sampling : 20.12.2022

Date of Analysis : 21.12.2022

SL. No.	Name of the Parameters	Unit	Conc. Limit as per schedule-II of Hazardous waste Rule,2016	Analysis Result S1
1	Arsenic	mg/kg	5.0	<0.004
2	Cadmium	mg/kg	1.0	0.56
3	Chromium and/or chromium(III) compound	mg/kg	5.0	1.75
4	Lead	mg/kg	5.0	0.43
5	Manganese	mg/kg	10.0	<0.05
6	Mercury	mg/kg	0.2	<0.002
7	Selenium	mg/kg	1.0	<0.001
8	Cobalt	mg/kg	80.0	<0.05
9	Copper	mg/kg	25.0	0.38
10	Molybdenum	mg/kg	35.0	<1.0
11	Nickel	mg/kg	20.0	0.57
12	Zinc	mg/kg	250.0	<5.0
13	Fluoride	mg/kg	180.0	1.2
14	Polychlorinated Biphenyls (PCBs)	mg/kg	<2	0.4
15	Polyaromatic Hydrocarbons (PAH)	%	6.0	0.6
Hazardous Characteristics as per Schedule-II Class C of Hazardous Waste Rule,2016				
16	Flammable	--	--	Liquid
17	Corrosive(pH)	--	--	5.3
18	Reactive or Explosive	--	--	Reactive

