



BAL/Mines/141/2015-16

Dated: 30.05.2016

To

The Director (S),
Ministry of Environment, Forests & CC
Eastern Regional office,
A/3, Chandrasekharpur,
Bhubneswar – 751023

Sub: Six-monthly compliance report of conditions of Environment Clearance vide letter no J-1105/139/2012-IA.II (M) dated 22.08.2014 with respect to Kaliapani Chromite Mines of M/s Balasore Alloys Ltd for the period October 2015 – March 2016.

Ref: Environment Clearance No:- J-1105/139/2012-IA.II (M) dated 22.08.2014

Dear Sir,

We are here with enclosed the compliance report to the conditions stipulated in the Environment Clearance vide no J-1105/139/2012-IA.II (M) dated 22.08.2014 for the period October 2015 – March 2016 with respect to our Kaliapani Chromite Mines of M/s Balasore Alloys Ltd. for your kind perusal.

Thanking you,

Yours faithfully,
For M/s Balasore Alloys Ltd

Amarnath Dhar
(Mines Manager)

Encl: As above
Copy to: MOE& CC, New Delhi



Status of compliance of conditions stipulated by MoEF in Environment Clearance no.- No. J-11015/139/2012-IA.II (M) dated 22.08.2014 of Kaliapani Chromite Mine of M/s Balasore Alloys Ltd as on 31.03.2016

A. Specific Conditions & their Status

- i. **Mining shall not commence without necessary permissions for drawl of water and intersection of ground water table.**

Status- Permission has been obtained for drawl of water and intersection of ground water table during mining activities from Central Ground Water Authority, Govt.Of India ,Ministry Of Water Resource, vide CGWA/NOC/MIN/ORIG/2015/2122 Dated 10.12.2015 , for drawl of ground water of for 3293 m³/Day (3188 m³/Day from Mine Dewater & 105 m³/Day from Bore well). Copy of the same is attached as **Annexure-I**.

- ii. **Mitigation measures such as well-designed ventilation network within underground mine, provision of Personal Protective Equipment should be ensured and necessary training and awareness programs for mine workers should be undertaken.**

Status- Ventilation fan shall be provided within underground mine in order to control the air pollution. Necessary PPEs viz helmet, Dust mask etc shall be provided to the employees. Training and awareness programme for mine worker regarding health Safety and Environment is going on regular basis and shall be continued.

- iii. **Continuous monitoring of Mine water should be done and reports furnished.**

Status- Mine water from mine pit is channelized to up graded ETP designed as per the recommendation of IIT, Kharagpur for proper treatment, continuous monitoring of quality and quantity of Mine water (viz parameters pH, TSS, Cr+6, Flow Rate) is going on through online monitoring system installed at ETP Outlet and Inlet as per the Guidelines by CPCB for Real-time Effluent Quality Monitoring System. The monitoring data also transferred to OSPCB website through Real data Acquisition System.

- iv. **Continuous monitoring of all drinking water sources for Cr(VI) of Mine water should be done and reports furnished.**

Status- Monitoring of drinking water sources inside mine are being done continuously for all the parameters as per IS10500 standards along with Cr(VI). The analysis report is confirming the drinking water standard of CPCB. The analysis report of the same is given in **Table-1**.



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**KALIAPANI CHROMITE MINES
BALASORE ALLOYS LTD.**

[Table-1: Drinking Water Analysis Report]
Drinking Water Analysis Report (Oct-2015 to March 2016)
M/s Balasore Alloys Limited
Kaliapani Chromite Mines

Station 1:Administrative Building									
SL · NO	PARAMET ERS	UNITS	STANDAR DS	Period					
			(IS:10500)	15-Oct	15-Nov	15-Dec	16-Jan	16-Feb	16-Mar
1	pH	-	6.5-8.5	7.1	7.9	7.39	7.08	7.14	6.87
2	Odour	-	Unobjectiona ble	U/O	U/O	U/O	U/O	U/O	U/O
3	Colour	Hazen	5(max)	CL	CL	CL	CL	CL	CL
4	Taste	-	Agreeable	AL	AL	AL	AL	AL	AL
5	Turbidity	NTU	5(max)	2	3	4	0.4	0.6	0.8
6	Chloride(as Cl)	Mg/L	250(max)	5	4.8	4.6	5.6	5.8	6.1
7	Residual Free Chlorine	Mg/L	0.2(min)	ND	ND	ND	ND	ND	ND
8	Total Dissolved Solids	Mg/L	500(max)	122	102	120	102	98	89
9	Total Hardness(a s CaCO ₃)	Mg/L	300(max)	45	40	44	46	37	42
10	Iron(as Fe)	Mg/L	0.3(max)	0.16	0.18	0.24	0.22	0.2	0.17
11	Calcium(as Ca)	Mg/L	75(max)	12	14.6	12.3	11.8	12.2	12.8
12	Magnesium (as Mg)	Mg/L	30(max)	5.6	5.2	4.7	5.5	5.3	5.4
13	Sulphate(as SO ₄)	Mg/L	200(max)	9.8	13.2	14.1	12.6	11.5	11.9
14	Manganese (as Mn)	Mg/L	0.1(max)	<0.0000 1	<0.0000 1	<0.0000 1	<0.0000 1	<0.0000 1	<0.0000 1
15	Nitrate(as NO ₃)	Mg/L	45(max)	0.22	0.24	0.2	0.26	0.27	0.21
16	Alkalinity(a s CaCO ₃)	Mg/L	200(max)	18	20	22	0.25	21	24
17	Chromium(as Cr ⁶⁺)	Mg/L	0.05	0.01	0.006	0.01	0.014	0.018	0.012


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18	Fluorides(as F)	Mg/L	1.5	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
19	Cadmium(as Cd)	Mg/L	0.01(max)	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
20	Copper(as Cu)	Mg/L	0.05(max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
21	Zinc(as Zn)	Mg/L	5(max)	0.1	0.13	0.1	0.13	0.1	0.12
22	Lead(as Pb)	Mg/L	0.05(max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
23	Selenium(as Se)	Mg/L	0.01(max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
24	Mineral Oil	Mg/L	0.01(max)	ND	ND	ND	ND	ND	ND
25	Mercury(as Hg)	Mg/L	0.001(max)	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
26	Cyanide(as CN)	Mg/L	0.05(max)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
27	Boron	Mg/L	1(max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
28	Arsenic(as As)	Mg/L	0.05	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
29	Phosphorous	Mg/L	....	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

Station-2: Mines Canteen

SL NO	PARAMETERS	UNIT S	STANDARDS							
			(IS:10500)	15-Oct	15-Nov	15-Dec	16-Jan	16-Feb	16-Mar	16-Apr
1	pH	-	6.5-8.5	6.56	7.46	7.27	7.42	7.33	7.24	
2	Odour	-	Unobjectionable	U/O	U/O	U/O	U/O	U/O	U/O	U/O
3	Colour	Hazen	5(max)	CL	CL	CL	CL	CL	CL	CL
4	Taste	-	Agreeable	AL	AL	AL	AL	AL	AL	AL
5	Turbidity	NTU	5(max)	2	2	2	0.3	0.2	0.6	
6	Chloride(as Cl)	Mg/L	250(max)	4.4	4.2	4	4.8	4.3	4.2	



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7	Residual Free Chlorine	Mg/L	0.2(min)	ND	ND	ND	ND	ND	ND	ND
8	Total Dissolved Solids	Mg/L	500(max)	130	114	109	96	92	94	
9	Total Hardness(as CaCO ₃)	Mg/L	300(max)	40	43	48	54	50	51	
10	Iron(as Fe)	Mg/L	0.3(max)	0.18	0.22	0.29	0.33	0.36	0.28	
11	Calcium(as Ca)	Mg/L	75(max)	13.4	10.8	13.6	12.7	11.7	12.1	
12	Magnesium(as Mg)	Mg/L	30(max)	5.2	6.2	5.4	6	5.8	5.7	
13	Sulphate(as SO ₄)	Mg/L	200(max)	12.4	11.9	10.5	13.2	12.3	12.5	
14	Manganese(as Mn)	Mg/L	0.1(max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
15	Nitrate(as NO ₃)	Mg/L	45(max)	0.28	0.3	0.24	0.28	0.32	0.28	
16	Alkalinity(as CaCO ₃)	Mg/L	200(max)	24	27	26	32	26	29	
17	Chromium(as Cr ⁶⁺)	Mg/L	0.05	0.008	0.004	0.008	0.018	0.024	0.026	
18	Fluorides(as F)	Mg/L	1.5	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
19	Cadmium(as Cd)	Mg/L	0.01(max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
20	Copper(as Cu)	Mg/L	0.05(max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
21	Zinc(as Zn)	Mg/L	5(max)	0.14	0.17	0.15	0.18	0.14	0.18	
22	Lead(as Pb)	Mg/L	0.05(max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
23	Selenium(as Se)	Mg/L	0.01(max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
24	Mineral Oil	Mg/L	0.01(max)	ND	ND	ND	ND	ND	ND	ND
25	Mercury(as Hg)	Mg/L	0.001(max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001


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26	Cyanide(as CN)	Mg/L	0.05(max)	<0.00 2	<0.002	<0.002	<0.00 2	<0.002	<0.002	<0.00 2
27	Boron	Mg/L	1(max)	<0.00 01	<0.000 1	<0.000 1	<0.00 01	<0.000 1	<0.000 1	<0.00 01
28	Arsenic(as As)	Mg/L	0.05	<0.00 01	<0.000 1	<0.000 1	<0.00 01	<0.000 1	<0.000 1	<0.00 01
29	Phosphorous	Mg/L	...	<0.00 01	<0.000 1	<0.000 1	<0.00 01	<0.000 1	<0.000 1	<0.00 01

v. Morbidity pattern which is a sensitive indicator of ill health with regard to Cr related diseases need to be done.

Status- A morbidity pattern study has been done by engaging Asian Institute of Public Health, Bhubaneswar with overall aim to create baseline data base on current status of occupational health risks especially morbidity pattern with regard to Chromium and air born dust associated with the facility & identify unhealthy behaviour of exposures. The major findings and morbidity pattern are given below.

MAJOR FINDINGS:

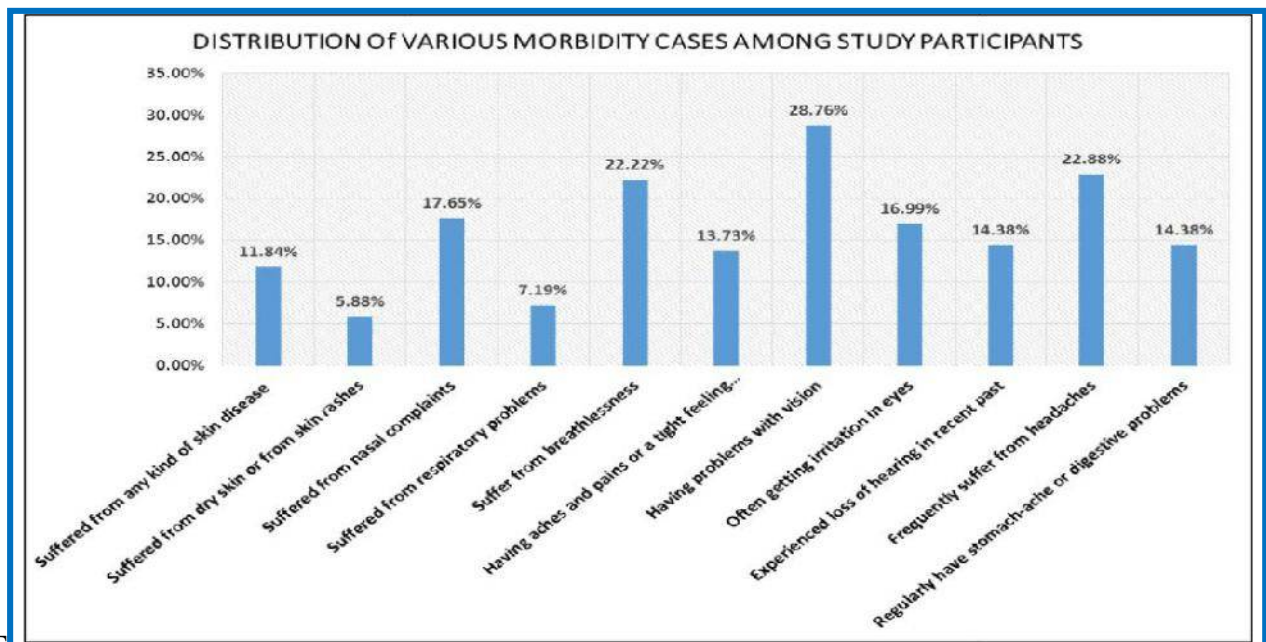
- With regards to availability of medical facilities, as per majority (72.85%) of the population the facilities were not adequate. And only 27% participants responded positively.
- 55% of the respondents reported that the canteen facility was adequate and according to the rest the facility was inadequate.
- According to one fourth of the respondents, the cold drinking water facility was inadequate.
- Around 21% of the respondents say that, availability of washing facility was inadequate.
- As per 66% of the respondents the toilet facility was inadequate only 33% respondents were satisfied by the facility
- According to only 28% of the employees the physical working environment was adequate and suitable.
- The analysis revealed that 53% of the employees believed that the steps taken against dust generation were adequate, while the others felt it was inadequate.
- 22% participants revealed that they usually suffer from breathlessness while performing physical activities.
- After the analysis it came to light that in the last five years, muscular problems or joint problems was the greatest cause of morbidity among the study participants; followed by long-term neck or back complaints, high blood pressure and stomach complaints.



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MORBIDITY PATTERN:

The assessment on the morbidity status among the study participants shows the following morbidity pattern:



The findings of assessment show that, problems with vision (28%), Breathlessness (22%), Headache (22%) are the major contributors towards the current morbidity conditions. Hence it is hereby concluded that, there is no definite pattern/figure to be mentioned as the key indicator of the morbidity resulting from chrome related exposure rather it indicate that the pattern of morbidity follows the general trend of villages or urban areas elsewhere.

Based upon the outcome of result, action is being taken.

- iv. **Mine water discharge and/or any waste water shall be properly treated in an ETP/s for the removal of hexavalent chromium and to meet the prescribed standards before reuse/discharge. The runoff from OB dumps and other surface run off shall be analyzed for hexavalent chrome and in case its concentration is found higher than the permissible limit, the waste water should be treated before discharge/reuse.**

Status- Mine water discharge is channelized to Effluent Treatment Plant present at mines to remove the Cr+6 and some of treated water are used for Dust Suppression, Plantation, COBP and rest discharged outside. Regular monitoring of treated water is going on through Online analyser and report transferred to OSPCB website through RTDAS . Report for the period of Oct,2015 to March,2016 is provided as **Annexure-II**. The photos of Present ETP given below

Photo-1 New up-graded ETP

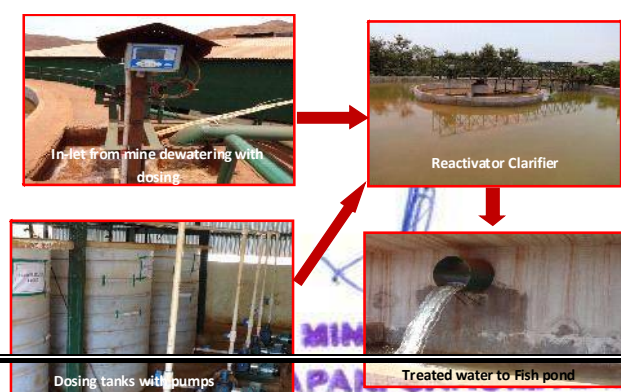




Photo-02: On-Line Monitoring System installed at In-let & Out-Let of ETP



The Run-off from OB dumps and other surface run off are properly collected through garland drains, settling pond & channelized to ETP by pump & pipeline facility for proper treatment before discharge to outside. Run off from OB dumps and other surface run-off are being analyzed on fortnightly basis during monsoon period. Report of the surface runoff analysis given in **Table-2**. The photo of the same is shown as **Photo: 3**.

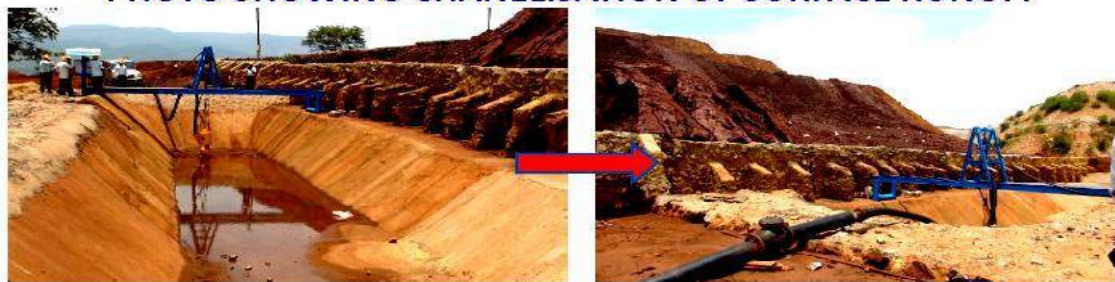

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[Table-2: Surface Run-off analysis Report]

KALIAPANI CHROMITE MINES									
M/s BALASORE ALLOYS LTD.									
SURFACE RUN OFF ANALYSIS REPORT									
Period				Jul-15		August-2015		September-2015	
Sl No.	Parameter	Unit	Prescribed standard	SRF-1	SRF-2	SRF-1	SRF-2	SRF-1	SRF-2
1	Ph	.....	5.5-9.0	7.68	7.22	7.51	7.36	7.41	7.18
2	TSS	mg/L	100	79	88	86	92	82	80
3	Cr ⁺⁶	mg/L	0.1	0.036	0.032	0.042	0.021	0.044	0.023

PHOTO-3: Showing Channelization of Surface Run-off to ETP through Settling Pit From Dumping Area

PHOTO SHOWING CHANELISATION OF SURFACE RUNOFF



**SURFACE RUN-OFF
MANAGEMENT FROM
TAILING POND AREA
DUMP NO.- 03**



[Handwritten Signature]
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PHOTO SHOWING CHANELISATION OF SURFACE RUNOFF



**SURFACE RUN-OFF
MANAGEMENT FROM
COMMON DUMPING
AREA TO ETP**



- vi. The project proponent shall obtain Consent to Establish and Consent to Operate from the State Pollution Control Board, Odisha and effectively implement all the conditions stipulated therein.

Status- Consent to establish has obtained from SPCB, Odisha vide letter No. 18196/ IND-II-NOC- 5723 dated 08.10.2013 & subsequently Consent to Operate has obtained from SPCB, Odisha vide letter No. 557/ IND-I-CON-2576 dated 12.01.2015. Copy of the same are attached as **Annexure- II & III**. All the conditions stipulated in Consent to Establish and Consent to Operate are effectively implemented.

- vii. Traffic density on the route of mineral transportation shall be regularly monitored and report shall be submitted along with compliance report.

Status- Traffic density is being monitored on the route of mineral transportation at three locations and the monitoring report is given in **Table-3**.

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[Table-3: Traffic Density Monitoring Report]

Kaliapani Chromite Mines										
Traffic Density Study Report										
Station	Working Days				Non Working Days			Market Days		
	Result	Light Vehicle	Medium Vehicle	Heavy Vehicle	Light Vehicle	Medium Vehicle	Heavy Vehicle	Light Vehicle	Medium Vehicle	Heavy Vehicle
Mines main Gate	Total Nos	480	168	404	580	34	6	880	195	182
	Avg Traffic Load/Hr	13.91	7	16.83	24.16	1.41	0.25	36.66	8.12	7.58
	Passenger Car Unit(PCU) Factor	0.75	2	3.7	0.75	2	3.7	0.75	2	3.7
	PCU/Hr	10.43	14	62.27	18.12	2.82	0.92	27.49	16.24	28.04
Kalarngiatta	Total Nos	986	282	775	432	96	89	394	122	88
	Avg Traffic Load/Hr	41.08	11.75	32.29	18	4	3.7	16.62	5.16	3.79
	Passenger Car Unit(PCU) Factor	0.75	2	3.7	0.75	2	3.7	0.75	2	3.7
	PCU/Hr	30.81	23.5	119.47	13.5	8	13.69	12.46	10.32	14.02
Kansa	Total Nos	309	194	720	760	259	226	738	55	92
	Avg Traffic Load/Hr	12.87	8.08	29.8	31.66	10.79	9.33	30.75	2.29	3.83

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	Passenger Car Unit (PCU) Factor	0.75	2	3.7	0.75	2	3.7	0.75	2	3.7
	PCU/Hr	9.65	16.16	110.26	1.31	21.58	34.52	23.06	4.58	14.17

viii. As part of ambient air quality monitoring during operational phase of the project, the air samples shall also be analysed for their mineralogical composition and records maintained.

Status- Mineralogical composition as part of Ambient air is being monitored in six locations of core and buffer zone of the lease area. The air samples are also being analysed for all the 12 parameters as per CPCB guideline and data recorded. The analysis report of the same is given in the **Table-4**.

AMBIENT AIR QUALITY FOR THE PERIOD Oct-March,2016																
M/s BALASORE ALLOYS LIMITED																
KALIAPANI CHROMITE MINES																
S l. No.	Monitoring Stations	Station Code	Month	Range	CONCENTRATION in $\mu\text{g}/\text{m}^3$				CO (Result in mg/CuM)	O ₃ (Micro Gram/CuM)	NH ₃ (Micro Gram/CuM)	Pb $\mu\text{g}/\text{m}^3$	Ni ng/m^3	Benzene $\mu\text{g}/\text{m}^3$	Benzo(a) Pyrene ng/m^3	As ng/m^3
					P M 10	P M 2.5	S O 2	N O x								
1	Rooftop of Administrative Building (Core Zone) Elevation- 123M N2100 2'47" E85045 '14.2"	A A Q-1	October-15	AVERAGE	75.3	36.0	7.2	13.9	0.3	6.1	BDL					
				MAX. VALUE	85.0	41.0	8.8	16.2	0.4	6.4	BDL					
				MIN. VALUE	64.0	31.0	5.6	10.4	0.2	5.8	BDL					
			November-15	AVERAGE	80.1	31.6	7.06	14.7	0.3	7.34	BDL					
				MAX. VALUE	89	37	7.6	16.6	0.4	7.8	BDL					
				MIN. VALUE	73	28	5.9	12.6	0.2	6.8	BDL					
			December-15	AVERAGE	75.2	30.1	7.0	14.0	0.3	6.8	BDL					
				MAX. VALUE	90.0	39.0	8.0	16.4	0.4	7.8	BDL					
				MIN. VALUE	58	21.0	5.1	10.2	0.2	6	BDL					


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				.0		8	1.9											
			January-16	AVERAGE	62.4	27.4	7.1	11.3	0.3	7.4	27.3	0.01	<0.5	0.5	0.1	<0.1		
				MAX. VALUE	71.5	33.4	7.9	13.7	0.3	7.9	33							
				MIN. VALUE	53.2	23.4	5.9	9.7	0.3	6.7	23							
			February-16	AVERAGE	61.5	26.5	6.9	11.5	0.3	7.1	28.3	0.01	<0.5	0.4	0.2	<0.1		
				MAX. VALUE	70.8	32.5	7.7	14.1	0.3	7.5	35							
				MIN. VALUE	52.1	22.6	5.7	8.7	0.3	6.1	22							
			March-16	AVERAGE	56.5	22.2	6.6	10.8	0.3	6.2	23.3	0.01	<0.5	0.3	0.1	<0.1		
				MAX. VALUE	62.3	24.2	7.3	11.6	0.3	6.8	26							
				MIN. VALUE	50.4	20.1	6.1	10.2	0.3	5.6	20							
2	Roof top of Bachel or Barrack Elevator- 127M N2100 2'5.7" E85045 '34.2"	A A Q- 2	October-15	AVERAGE	72.6	36.8	7.1	13.8	0.3	6.6	BDL							
				MAX. VALUE	86.0	44.0	7.8	15.6	0.4	7.2	BDL							
				MIN. VALUE	58.0	27.0	5.8	11.2	0.2	5.8	BDL							
			November-15	AVERAGE	73.1	29.4	6.7	14.3	0.3	6.3	BDL							
				MAX. VALUE	85.0	35.0	7.7	16.6	0.3	7.4	BDL							
				MIN. VALUE	63.0	24.0	5.9	10.8	0.2	5.6	BDL							
			December-15	AVERAGE	72.8	28.9	6.4	13.8	0.3	6.1	BDL							
				MAX. VALUE	89.0	38.0	7.8	16.2	0.4	7.2	BDL							
				MIN. VALUE	55.0	20.0	5.7	10.9	0.2	5.2	BDL							
			January-16	AVERAGE	54.7	25.7	6.7	11.4	0.3	8.1	31.875	0.01	<0.5	0.4	0.1	<0.1		


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3	Open cast quarry (Core Zone) Elevati on-155M N21° 01' 57.8" E85° 46' 01.2"	A A Q-3	February-16	MAX. VALU E	59.4	28.1	7.8	12.6	0.3	8.5	36								
				MIN.V ALUE	51.2	23.4	5.9	10.3	0.3	7.7	28								
				AVER AGE	56.1	26.0	6.5	10.9	0.3	7.2	32.9	0.02	<0.5	0.5	0.1	<0.1			
				MAX. VALU E	58.4	28.2	7.2	11.8	0.3	7.9	35								
				MIN.V ALUE	52.4	23.4	5.8	9.7	0.3	6.2	30								
				AVER AGE	54.4	22.6	6.1	11.1	0.3	6.5	29.6	0.01	<0.5	0.2	0.2	<0.1			
			March-16	MAX. VALU E	57.2	24.3	6.9	12.1	0.3	7.2	32								
				MIN.V ALUE	50.4	20.7	5.2	10.1	0.3	5.7	26								
				AVER AGE	54.5	22.3	6.4	11.6	0.3	6.4	BDL								
			October-15	MAX. VALU E	85.0	44.0	8.3	16.5	0.4	7.2	BDL								
				MIN.V ALUE	59.0	28.0	6.4	12.6	0.2	5.5	BDL								
				AVER AGE	33.9	7.8	7.8	15.5	0.3	6.9	BDL								
November-15	MAX. VALU E	39.0	8.4	8.4	16.7	0.4	7.8	BDL											
	MIN.V ALUE	29.0	7.0	7	14.8	0.2	5.6	BDL											
	AVER AGE	32.2	7.1	7.1	15.3	0.3	7.1	BDL											
December-15	MAX. VALU E	42.0	8.6	8.6	17.3	0.4	8.2	BDL											
	MIN.V ALUE	23.0	5.6	5.6	12.6	0.2	5.6	BDL											
	AVER AGE	39.7	8.3	8.3	13.4	0.4	7.5	35	0.02	<0.5	0.7	0.3	<0.1						
January-16	MAX. VALU E	44.2	8.9	8.9	14.2	0.4	8.8	39											
	MIN.V ALUE	33	7.1	7.1	11	0.4	6.9	31											
	AVER AGE	39.7	8.3	8.3	13.4	0.4	7.5	35	0.02	<0.5	0.7	0.3	<0.1						


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				.6		1	2.									
			Febru	AVER	43.	8.4	8.	13	0.4	7.6	34.1	0.0	<0.			<0.
			ary-	AGE	3		4	.9				2	5	0.8	0.3	1
			16	MAX.	71.	9.8	9.	15	0.4	8.1	38					
				VALU	2		8	.1								
				E												
				MIN.V	34.	7.5	7.	12	0.4	6.8	30					
				ALUE	8		5	.7								
			Marc	AVER	34	7.2	7.	1	0.4	6.4	24.7	0.0	<0.			<0.
			h-16	AGE	.8		2	4.				3	5	0.9	0.4	1
				MAX.	38	7.5	7.	1	0.4	6.8	31					
				VALU	.1		5	5.								
				E			4	4								
				MIN.V	32	6.8	6.	1	0.4	5.7	20					
				ALUE	.3		8	3.								
							3	3								
			Octo	AVER	61	29.	5.	1	0.2	5.5	BDL					
			ber-	AGE	.5	6	7	1								
			15	MAX.	72	34.	6.	1	0.3	6	BDL					
				VALU	.0	0	8	3.								
				E			6	6								
				MIN.V	50	24.	4.	9.	0.2	4.6	BDL					
				ALUE	.0	0	9	9								
			Nove	AVER	68.	27.	5.	12	0.2	5.4	BDL					
			mber-	AGE	6	4	8	.0								
			15	MAX.	75.	30.	6.	13	0.2	6.2	BDL					
				VALU	0	0	6	.2								
				E			6	6								
				MIN.V	62.	24.	5.	10	0.2	5	BDL					
				ALUE	0	0	2	.7								
			Dece	AVER	65	26.	5.	1	0.2	5.4	BDL					
			mber-	AGE	.9	0	7	1								
			15	MAX.	77	31.	6.	1	0.2	6.3	BDL					
				VALU	.0	0	5	3.								
				E			2	2								
				MIN.V	52	19.	4.	9.	0.2	4.3	BDL					
				ALUE	.0	0	8	9								
			Janua	AVER	54	23.	7.	1	0.3	7.0	23.6	0.0	<0.			<0.
			ry-16	AGE	.5	6	1	4				2	5	0.5	0.2	1
				MAX.	59	27.	7.	1	0.3	7.7	28					
				VALU	.2	2	8	3.								
				E			7	7								
				MIN.V	50	20.	6.	9.	0.3	6.2	21					
				ALUE	.4	1	3	8								
			Febru	AVER	53.	23.	7.	11	0.3	7.1	24.4	0.0	<0.			<0.
				AGE	8	4	0	.2				1	5	0.5	0.1	1

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**KALIAPANI CHROMITE MINES
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5	Village Ransol (Buffer Zone) Elevation- 113M N21° 03' 43.1" E85° 44' 32.2"	A A Q-5	ary-16	MAX. VALU E	59.2	28.8	7.5	12.7	0.3	7.8	29							
				MIN.V ALUE	50.1	20.5	6.3	9.7	0.3	6.1	22							
				March-16	AVER AGE	55.7	23.1	6.2	11.4	0.3	6.3	22.3	0.01	<0.5	0.5	0.1	<0.1	
					MAX. VALU E	60.2	25.8	6.8	12.2	0.3	6.8	27						
					MIN.V ALUE	51.3	20.1	5.3	10.2	0.3	5.6	19						
				October-15	AVER AGE	59.0	31.0	5.6	11.3	0.2	5.6	BDL						
			MAX. VALU E		65.0	35.0	6.2	12.7	0.2	6.5	BDL							
			MIN.V ALUE		52.0	25.0	5.0	10.2	0.2	5	BDL							
			November-15	AVER AGE	65.0	27.0	5.9	12.5	0.2	5.4	BDL							
				MAX. VALU E	71.0	32.0	7	14.7	0.2	5.6	BDL							
				MIN.V ALUE	55.0	22.0	5	10.3	0.2	5	BDL							
			December-15	AVER AGE	64.0	26.2	5.7	12.5	0.2	5.2	BDL							
MAX. VALU E	79.0	35.0		6.3	13.4	0.2	5.6	BDL										
MIN.V ALUE	49.0	18.0		4.8	10.6	0.2	4.8	BDL										
January-16	AVER AGE	53.0	23.4	7.1	10.7	0.3	7.1	27	0.01	<0.5	0.6	0.1	<0.1					
	MAX. VALU E	57.3	25.2	7.8	11.4	0.3	7.6	33										
	MIN.V ALUE	48.9	22.2	6.6	9.7	0.3	6.5	21										
February-16	AVER AGE	53.8	23.4	7.1	10.7	0.3	7.2	27.5	0.01	<0.5	0.5	0.1	<0.1					
	MAX. VALU E	58.5	26.5	7.5	11.6	0.3	7.8	33										



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			MIN.V ALUE	49. 5	20. 5	6. 8	9. 4	0.3	6.4	24						
			AVER AGE	55 .3	22. 7	6. 8	1 0. 7	0.3	6.7	24.2	0.0 1	<0. 5	0.5	0.1	<0. 1	
			MAX. VALU E	60 .1	25. 9	7. 2	1 1. 4	0.3	7.3	30						
			MIN.V ALUE	51 .5	19. 6	6. 3	1 0. 1	0.3	6.2	19						
6	Village Sukran gi (Buffer Zone) Elevati on- 153M N21° 02' 44.5" E85° 48' 16.3"	A A Q- 6	Octo ber- 15	AVER AGE	66 .9	32. 8	6. 1	1 2. 1	0.2	6.5	BDL					
				MAX. VALU E	95 .0	42. 0	7. 8	1 5. 8	0.3	7.6	BDL					
				MIN.V ALUE	51 .0	24. 0	5. 0	1 0. 0	0.2	5.3	BDL					
			Nove mber- 15	AVER AGE	73. 0	29. 3	6. 5	13 .3	0.2	5.7	BDL					
				MAX. VALU E	80. 0	34. 0	7. 3	15	0.2	6.4	BDL					
				MIN.V ALUE	63. 0	25. 0	5. 4	11 .7	0.2	4.8	BDL					
			Dece mber- 15	AVER AGE	64 .3	27. 7	5. 7	1 1. 4	0.2	5.6	BDL					
				MAX. VALU E	84 .0	39. 0	6. 6	1 3. 4	0.3	6.6	BDL					
				MIN.V ALUE	48 .0	18. 0	4. 8	9. 6	0.2	4.5	BDL					
			Janua ry-16	AVER AGE	55 .8	24. 3	7. 0	1 0. 6	0.3	7.0	27.25	0.0 1	<0. 5	0.6	0.1	<0. 1
				MAX. VALU E	60 .4	26. 2	7. 8	1 1. 8	0.3	7.6	37					
				MIN.V ALUE	49 .8	21. 7	6. 4	9. 6	0.3	6.4	21					
		Febru ary- 16	AVER AGE	54. 0	22. 7	7. 0	10 .5	0.3	6.8	27.8	0.0 2	<0. 5	0.6	0.2	<0. 1	
			MAX. VALU E	58. 2	26. 4	7. 8	11 .8	0.3	7.5	35						
			MIN.V ALUE	48. 9	19. 8	6. 4	8. 9	0.3	5.6	20						
		Marc	AVER AGE	55 .5	22. 5	6. 1	1	0.3	6.3	24.3	0.0 1	<0. 5	0.4	0.2	<0. 1	


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			h-16	.0		3	0.9								
			MAX. VALU E	58.4	25.6	7.2	11.8	0.3	6.8	32					
			MIN.V ALUE	52.3	19.8	5.6	10.2	0.3	5.1	17					
NORMS(ANNUAL)				60.0	40.0	50.0	40.0	4(1Hr)	180(1Hr)	100.0	0.5	20	5	1	6
NORMS(24HOURS)				100.0	60.0	80.0	80.0	2.0	100(8Hr)	400.0	1				

ix. Mineral handling plant shall be provided with adequate number of high efficiency dust extraction system. Loading and unloading areas including all the transfer points should also have efficient dust control arrangements. These should be properly maintained and operated.

Status- Mineral handling plant in the form of chrome ore beneficiation is in operation and working in wet process. However water sprinkling is going on through fixed sprinkler inside COB area and through water tankers at loading and unloading points including transfer points regularly to control the generation of dust. Photo of COB Plant as Photo-4 fixed sprinkler given as Photo-5 & water takers as Photo-6.

PHOTO-4 : SHOWING COB PLANT



PHOTO-5

: SHOWING FIXED SPRINKLER



Fixed Sprinkler at Haul Road

PHOTO-6 : SHOWING MOBILE SPRINKLERS INSIDE MINES



- x. **Effective safeguard measures such as conditioning of ore with water, regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of particulate matter such as around crushing and screening plant, loading and unloading point and transfer points. It should be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.**

Status- Regular water sprinkling has been going on engaging two nos of water tankers of 12 KL capacity at critical areas prone to air pollution and having high levels of particulate matter such as loading and unloading point, transfer points, haul road & stack area etc. Fixed type of sprinklers also installed near COB plant to arrest the fugitive dust. Photo of the same is shown as **Photo- 5 & 6.**

Ambient air quality monitoring is being done by establishing 6 ambient air monitoring stations in core and buffer zone of the lease area. The analysis result of all the parameters conform to the norms prescribed by the Central Pollution Control Board. The monitoring data for the period Oct,2015 to March,2016 is given in **Table-4.**

- xi. The project authority shall implement suitable conservation measures to augment ground water resources in the area in consultation with the Regional Director, Central Ground Water Board.**

Status- Rooftop rain water harvesting structure has implemented to augment ground water resources in the area in consultation with the Regional Director, Central Ground Water Board and construction of another structure is in process. The photo of the same is shown as **Photo: 7.** The schematic diagram and technical details attached as **Annexure—IV.**


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PHOTO- 7: SHOWING ROOFTOP RAIN WATER HARVESTING STRUCTURE



xii. Regular monitoring of ground water level and quality shall be carried out in and around the mine lease by establishing a network of existing wells and installing new piezo meters during the mining operation. The periodic monitoring [(at least four times in a year- pre-monsoon (April- May), monsoon (August), post-monsoon (November) and winter (January); once in each season)] shall be carried out in consultation with the State Ground Water Board/Central Ground Water Authority and the data thus collected may be sent regularly to the Ministry of Environment and Forests and its Regional Office Bhubaneswar, the Central Ground Water Authority and the Regional Director, Central Ground Water Board. If at any stage, it is observed that the groundwater table is getting depleted due to the mining activity; necessary corrective measures shall be carried out.

Status- Regular monitoring of ground water level & quality has been monitored on quarterly basis at core and buffer zone at six different locations & data has been sent to the Ministry of Environment and Forests and its Regional Office Bhubaneswar, the Central Ground Water Authority and the Regional Director, Central Ground Water Board on regular basis.

We have installed four nos of Piezometers inside Core Zone and One piezometric at Vimtanger village to measure the ground water level .

Report of Ground water level and quality are given in **Table-5** & 6 respectively. However monitoring report reveals that there is no significant impact on ground water table due to mining activity.

[Table-5: Ground water level in buffer zone]

Ground Water Level report (Oct,2015-Feb, 2016)

M/S Balasore Alloys Ltd


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**KALIAPANI CHROMITE MINES
BALASORE ALLOYS LTD.**

Kaliapani Chromite mines						
Station	Water Table	Water Table	Water Table	Water Table	Water Table	Water Table
	(MBGL)	(MBGL)	(MBGL)	(MBGL)	(MBGL)	(MBGL)
	Oct-15	Nov-15	Dec-15	Jan-16	Feb.2016	March.2016
Buffer Zone						
kaliapani-1	3.0	3.2	3.3	3.3	3.5	3.8
kaliapani-2	4.2	4.2	4.2	4.3	4.5	4.7
Tisco Hutting	5.4	5.8	5.9	5.9	6.0	6.1
Sukrangi	2.7	3.0	3.9	3.2	3.3	3.5
Core Zone						
Piezohole-1	27.2	27.9	28.5	29.8	30.1	31.2
Piezohole-2	29.0	29.8	30.1	31.2	32.6	33.2

[Table-6: Ground water Quality Analysis Result]

Kaliapani Chromite Mines ,M/s BALASORE ALLOYS LTD									
GROUND WATER QUALITY									
Period-POST MONSOON (NOVEMBER 2015)									
Date of Sampling- 23.11.2015									
Sl No.	PARAMETERS	Unit	STANDARDS	Results of Post Monsoon period					
			(IS:10500)						
				GW1	GW2	GW3	GW4	GW5	GW6
1	pH	....	6.5-8.5	6.12	7.41	7.58	6.89	7.03	7.64
2	Odour	....	U/O	U/O	U/O	U/O	U/O	U/O	U/O
3	Colour	Hazen	5(Max)	CL	CL	CL	CL	CL	CL
4	Taste	....	Agreeable	AL	AL	AL	AL	AL	AL
5	Turbidity,	NTU	5(Max)	5.0	3.0	4.0	5.0	2.0	3.0
6	Chloride (as Cl)	mg/l	250(Max)	11.6	8.6	10.0	9.9	12.4	10.6
7	Residual Free Chlorine	mg/l	0.2(Min)	ND	ND	ND	ND	ND	ND
8	Total Dissolved Solids	mg/l	500(Max)	110	101	122	129	99	118
9	Total Hardness	mg/l	300(Max)	56	62	58	66	54	52
10	Iron as Fe	mg/l	0.3(Max)	0.18	0.22	0.16	0.26	0.20	0.16
11	Calcium(as Ca)	mg/l	75(Max)	13.6	12.4	15.2	11.8	13.7	13.8


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12	Magnesium(as Mg)	mg/l	30(Max)	8.6	9.4	9.2	8.8	7.90	8.40
13	Sulphates(as SO4)	mg/l	200(Max)	12.9	14.7	15.8	16.2	13.40	14.40
14	Manganese(as Mn)	mg/l	0.1(Max)	BDL	BDL	BDL	BDL	BDL	BDL
15	Nitrate(as NO3)	mg/l	45(Max)	0.50	0.58	0.53	0.58	0.64	0.66
16	Alkalinity as CaCO3	mg/l	200(Max)	25	34	28	33	36	26
17	Chromium(as Cr+6)	mg/l	0.05	0.006	0.016	0.004	0.014	0.026	0.008
18	Fluoride as F	mg/l	1.5	BDL	BDL	BDL	BDL	BDL	BDL
19	Cadmium(as Cd)	mg/l	0.01(Max)	BDL	BDL	BDL	BDL	BDL	BDL
20	Copper (as Cu)	mg/l	0.05(Max)	BDL	BDL	BDL	BDL	BDL	BDL
21	Zinc (as Zn)	mg/l	5(Max)	0.16	0.17	0.20	0.22	0.21	0.26
22	Lead (as Pb)	mg/l	0.05(Max)	BDL	BDL	BDL	BDL	BDL	BDL
23	Selenium (as Se)	mg/l	0.01(Max)	BDL	BDL	BDL	BDL	BDL	BDL
24	Mineral Oil	mg/l	0.01(Max)	ND	ND	ND	ND	ND	ND
25	Mercury (as Hg)	mg/l	0.001(Max)	BDL	BDL	BDL	BDL	BDL	BDL
26	Cyanide(as CN)	mg/l	0.05(Max)	BDL	BDL	BDL	BDL	BDL	BDL
27	Boron(as B)	mg/l	1(Max)	BDL	BDL	BDL	BDL	BDL	BDL
28	Arsenic(as As)	mg/l	0.05	BDL	BDL	BDL	BDL	BDL	BDL
29	Phosphorous as P	mg/l	....	0.57	0.62	0.68	0.48	0.55	0.50

Period-WINTER (JANUARY 2016)

Date of Sampling- 18.01.2016

Sl No.	PARAMETERS	Unit	STANDARDS	Results of Winter period					
			(IS:10500)						
				GW1	GW2	GW3	GW4	GW5	GW6
1	pH	....	6.5-8.5	7.10	6.92	7.82.00	7.38	6.26	7.00
2	Odour	....	U/O	U/O	U/O	U/O	U/O	U/O	U/O
3	Colour	Hazen	5(Max)	CL	CL	CL	CL	CL	CL
4	Taste	....	Agreeable	AL	AL	AL	AL	AL	AL
5	Turbidity,	NTU	5(Max)	0.4	0.2	0.4	0.5	0.3	0.6
6	Chloride (as Cl)	mg/l	250(Max)	10.2	11.4	9.8	7.4	13.5	8.9


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7	Residual Free Chlorine	mg/l	0.2(Min)	ND	ND	ND	ND	ND	ND
8	Total Dissolved Solids	mg/l	500(Max)	138	112	172	182	120	128
9	Total Hardness	mg/l	300(Max)	68	60	64	68	58	56
10	Iron as Fe	mg/l	0.3(Max)	0.20	0.21	0.18	0.24	0.26	0.24
11	Calcium(as Ca)	mg/l	75(Max)	15.2	14.4	13.8	12.8	12.2	11.2
12	Magnesium(as Mg)	mg/l	30(Max)	9.4	8.8	9.6	7.8	8.90	7.90
13	Sulphates(as SO4)	mg/l	200(Max)	15.7	16.8	14.9	13.8	12.6	12.80
14	Manganese(as Mn)	mg/l	0.1(Max)	BDL	BDL	BDL	BDL	BDL	BDL
15	Nitrate(as NO3)	mg/l	45(Max)	0.70	0.59	0.55	0.62	0.58	0.68
16	Alkalinity as CaCO3	mg/l	200(Max)	29	40	24	31	35	28
17	Chromium(as Cr+6)	mg/l	0.05	0.008	0.014	0.010	0.018	0.030	0.006
18	Fluoride as F	mg/l	1.5	BDL	BDL	BDL	BDL	BDL	BDL
19	Cadmium(as Cd)	mg/l	0.01(Max)	BDL	BDL	BDL	BDL	BDL	BDL
20	Copper (as Cu)	mg/l	0.05(Max)	BDL	BDL	BDL	BDL	BDL	BDL
21	Zinc (as Zn)	mg/l	5(Max)	0.13	0.15	0.25	0.20	0.26	0.24
22	Lead (as Pb)	mg/l	0.05(Max)	BDL	BDL	BDL	BDL	BDL	BDL
23	Selenium (as Se)	mg/l	0.01(Max)	BDL	BDL	BDL	BDL	BDL	BDL
24	Mineral Oil	mg/l	0.01(Max)	ND	ND	ND	ND	ND	ND
25	Mercury (as Hg)	mg/l	0.001(Max)	BDL	BDL	BDL	BDL	BDL	BDL
26	Cyanide(as CN)	mg/l	0.05(Max)	BDL	BDL	BDL	BDL	BDL	BDL
27	Boron(as B)	mg/l	1(Max)	BDL	BDL	BDL	BDL	BDL	BDL
28	Arsenic(as As)	mg/l	0.05	BDL	BDL	BDL	BDL	BDL	BDL
29	Phosphorous as P	mg/l	0.68	0.60	0.64	0.58	0.62	0.65

STATION	CODE
TISCO CAMP	GW-1


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BALASORE ALLOYS LTD.

VILLAGE KALIAPANI	GW-2
VILLAGE SUKRANGI	GW-3
INSIDE MINES	GW-4
VILLAGE CHINGUDIAPAL	GW-5
VILLAGE KALRANGI	GW-6

GW- GROUND WATER
U/O- UNOBJECTIONABLE
CL- COLOURLESS
ND- NOT DETECTED
BDL- BELOW DETECTION LIMIT

xiii. The project proponent shall regularly monitor the flow rate of the natural water streams flowing adjacent to the mine lease and maintain the records.

Status- The flow rate of Damsala Nallah is being regularly monitored at both upstream and downstream on quarterly basis and record has maintained. The flow rate in post-monsoon (Nov'2015) and Winter (January'2016) season is given in the **Table-07**

[Table-7: Flow rate of up-stream & down-stream at Damsala Nallah]

Flow rate of up-stream & down-stream at Damsala Nallah					
Kaliapani Chromite Mines of M/s Balasore Alloys Limited					
SI No	Location	Co-ordinate of the location	Month of Monitoring	Flow rate m ³ /s	Flow rate IN CUSEC
1	Damsala U/S	21°02'35.9"N 85°45'27.01"E	November'2015	2.86	101.02
2	Damsala D/S	21°02'10.47"N 85°44'31.92"E		3.80	134.05
3	Damsala U/S	21°02'35.9"N 85°45'27.01"E	January'2016	1.91	67.32
4	Damsala D/S	21°02'10.47"N 85°44'31.92"E		3.15	111.22

xiv. The reclaimed and rehabilitated area shall be afforested. Monitoring and management of rehabilitated areas shall continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment & Forests and its Regional Office located at Bhubaneswar on six monthly basis.

Status- Total 37100 Sqm area of dump slope has been covered by Geotextile and 16300 Sqm area covered with grass turffing & 76540 nos of saplings planted at dump slope, roadside in side ML area



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since 2010-11. The details of the same is given in **Table-8,9 &10** .

Photo of Plantation,coirmatting & Grass turffing attached as Photo 8,9 &10.

Regular Monitoring and management of rehabilitated areas is being done. Six monthly report of the same is being submitted to respective authority regularly.

DETAILS OF COIR MATTING & GRASS TURFING ON DUMP SLOPE

KALIAPANI CHROMITE MINES,M/s BALASORE ALLOYS LIMITED

Table-8: Details of Coirmatting

DETAILS OF COIRMATTING		
YEAR	LOCATION	AREA (SQM)
2010-11	Dump 2	5000
2011-12	Dump-3(IMFA side)	4500
2012-13	Dump-3(IMFA side)	4500
2013-14	Dump-3(Mahagiri side)	8600
2014-15	Dump-1 (North)	8500
2015-16	Dump 3 (North side)	6000
Total		37100

Table-9: Details of Grass Turffing

DETAILS OF GRASS TURFING		
YEAR	LOCATION	AREA (SQM)
2013-14	Dump-1 (Access road) slope	5000
2014-15	Dump-1 (Access road) slope	5200
2015-16	Washing Bay to View Point and common Boundary with IMFA	6100
Total		16300



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[Table-10: Details of Plantation inside ML area]

DETAILS OF INSIDE ML AREA PLANTATION					
M/s BALASORE ALLOYS LIMITED					
KALIAPANI CHROMITE MINES					
YEAR	LOCATION	AREA (Ha.)	NOS.	SURVIVAL %	SPECIES
2010-11	Dump-1	2	1120	87%	Acacia, Rain tree, Alstonia, C siamia, Pongamia,, Golmohur, Cashew, Teak, Jamun, Mango, Guava, Polyalthia, Thivetia, Citrus, Jackfruit, Albizzia, Neem & Bamboo)
	Inside mines premises (COB, Canteen & weigh bridge)		95	87%	
2011-12	Dump-3	0.8	1600	97%	C siamia, Pongamia, Albizzia, Bamboo, Sisoo, Teak, Casuarina, T chebula, Babul, Simuli, Bombax, Gmelina, Neem, Acacia, A mangium, Jackfruit, Guava, Citrus, Cashew, Pomegranate, Sapota and Alstonia
	Dump-1	1.2	8375	97%	
2012-13	Dump-3	0.2	250		C siamea, Pongamia, Albizzia, Bamboo, Sisoo, Teak, Jamun, Casuarina, Golmohur, Peltophorum, Alstonia, Neem, Gmelina, Acacia, Mimosups, Mango, Jackfruit, Guava, Citrus, Pomegranate, Sapota, Cashew and A mangium
	Dum-1	1.8	8150		
2013-14	Dump-3, slope	0.8	6882	95%	Peltophorum, Acacia, Albizzia, Pongamia, Tamarind, Almond, Neem and Arjun
	Safety zone, Dump-3	0.5	3018	95%	
	Dump-1 (Access road)	0.7	2085	97%	
2014-15	Dump-1 (Access road) slope and safety zone	1	2565	96%	Peltophorum, Acacia, A mangium, C siamia, Albizzia, Mango, Custard apple, Guava
	Dump-1 (North)	1.25	4000	96%	
	Dump-2 slope and safety zone	4	12000	98%	
2015-16	Admin. Office premises & Access road Jindal side from Old washing platform to View	1.25	5000	98%	Peltophorum, Acacia, Albizzia, Bouganvillea, Simarouba, Gliricidia and Arjun

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point (Dump-1)					
Common boundary with IMFA Area (Mines Pit)	1	4000	96%	Peltophorum, Acacia, Albizzia, Bouganvillea, Simarouba, Gliricidia, A mangium, Eucalyptus, Bamboo, Subbabul and Arjun	
Access road Jindal side along with Aloe vera Plantn (Dump-1)	0.3	1200	96%	Peltophorum, Acacia, Albizzia, Bouganvillea, Simarouba, Gliricidia and Arjun	
Over coirmatting of dump-3, 2nd terrace (mines pit side)	0.1875	750	96%	Peltophorum, Acacia, Albizzia, Bouganvillea, Simarouba, Gliricidia, A mangium, Eucalyptus, Bamboo, Subbabul and Arjun	
Dump-3(Jindal site Boundary area)	1.2	4800	96%	Peltophorum, Acacia, Albizzia, Bouganvillea, Simarouba, Gliricidia, A mangium, Eucalyptus, Bamboo, Subbabul and Arjun	
Dump-3 Slope	0.18	750	98%	Albizzia, Bouganvillea, Simarouba, Gliricidia, A mangium, Eucalyptus, Bamboo, Subbabul and Arjun	
TOTAL		76540			

PHOTO-8: SHOWING PLANTATION INSIDE ML AREA



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PHOTO-9: SHOWING COIR MATTING OVER DUMP SLOPE



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PHOTO-10: SHOWING GRASS TURFING OVER DUMP SLOPE



- xv. **Dimension of the retaining wall at the toe of temporary over burden dumps and OB benches within the mine to check run-off and siltation shall be based on the rain fall data.**

Status- Dimension of the retaining wall at the toe of temporary over burden dumps and OB benches within the mine to check run-off and siltation are based on the rain fall data. The details of the structures dump wise is given in **Table- 11**. Photo of the same is attached as **Photo- 9 to 10**.

[Table- 11: Environmental management measures of Over burden Dumps]

Environmental Measures	Dump-1	Dump-2	Dump-3
Retaining wall	320M×20M×7M	116M×2M×1M	380M×1M×2M, 150M×1M×5M
Garland drain	224 M	116 M	830 M
Coirmatting	8500 Cum	5000 Cum	16500 Cum
Plantation	36190 nos	12000 nos	13750 nos
Grass Turffing	10200 Cum		
Settling Pit	Two nos 90 Cum & 192 Cum		Two nos 972 Cum & 288 Cum

- xvi. **Plantation shall be raised in an area of 36.156 Ha. including a 7.5m wide green belt in the safety zone around the mining lease, backfilled and reclaimed area, around the higher benches of**

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excavated void to be converted in to water body, roads etc. by planting the native species in consultation with the local DFO/Agriculture Department. The density of the trees should be around 2500 plants per Ha.

Status- Year wise plantation programme is being undertaken on dump slopes and safety zone area. The details of the plantation year wise is given in **Table- 10**. **The density of trees planted is around 3000 nos/ha.**

Presently only one quarry is in operation, hence all measures as per the condition will be undertaken at the cessation of the quarry operations..

xvi. Effective safeguard measures such as regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of SPM and RPM such as haul road, loading and unloading point and transfer points. It shall be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.

Status- Regular water sprinkling is being done by deploying two no 12 KL mobile water tanker in critical areas prone to air pollution and having high levels of SPM & RPM such as loading and unloading point, transfer points, haul road & stack area etc. Fixed type of sprinklers also installed near COB plant to arrest the fugitive dust.

Ambient air quality monitoring is being done by establishing 6 ambient air monitoring stations in core and buffer zone of the lease area. The analysis result of all the parameters conform to the norms prescribed by the Central Pollution Control Board. The monitoring data for the period November 2015 to March 2016 is given in **Table-4**.

xvii. Process water discharge and/or any waste water shall be properly treated to meet the prescribed standards before reuse/discharge. The runoff from temporary OB dumps and other surface run off shall be analyzed for iron and in case its concentration is found higher than the permissible limit, the waste water should be treated before discharge/reuse.

Status- Process water in COB plant is completely reused and the treated water from the ETP is used as make-up quantity. However the quantity of water dewatered from mine pit is properly treated through an up graded Effluent Treatment Plant of capacity 445KL/Hr established with the recommendation of IIT, Kharagpur. The treated water has been monitored regularly and meeting the prescribed standards before reuse/discharge. The analysis report of treated water is given in **Table-12**.

Run off from OB dumps and other surface run-off are being analyzed on fortnightly basis during monsoon period at two different station inside ML area with the analysis of the iron concentration in surface run-off. However channelization of all surface run-off water to ETP for proper treatment is made through settling pit and pumping arrangement. Report of the surface runoff analysis of last monsoon(Oct'2015-March'2016) given in **Table-2**. **The surface run-off management photos and layout is given in Photo-3 .**



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Table-12
ETP ANALYSIS REPORT
KALIAPANI CHROMITE MINES

Sl. No.	Period	ETP INLET*		ETP OUTLET*	
		pH	Cr ⁶⁺ (mg/L)	pH	Cr ⁶⁺ (mg/L)
01.	01.10.15 - 07.10.15	6.02-7.65	0.155-3.954	6.26-7.9	0.010-0.030
02.	08.10.15 – 14.10.15	6.60-7.90	0.192-3.584	7.10-7.92	0.011-0.018
03.	15.10.15 – 21.10.15	6.70-7.56	0.375-3.070	6.98-7.45	0.010-0.016
04.	22.10.15 – 31.10.15	6.30-7.96	0.157-2.786	6.58-7.58	0.012-0.021
05.	01.11.2015-07.11.2015	6.94-7.03	1.201-3.166	7.21-7.81	0.014-0.018
06.	08.11.2015-14.11.2015	6.96-7.15	1.057-2.625	7.34-7.68	0.013-0.016
07.	15.11.2015-21.11.2015	6.87-7.56	1.307-3.814	7.11-8.12	0.015-0.023
08.	22.11.2015-30.11.2015	6.88-7.04	1.575-3.602	7.17-8.47	0.014-0.017
09	01.12.2015-07.12.2015	6.63-7.81	0.659-3.905	7.05-7.84	0.015-0.021
10	08.12.2015-14.12.2015	6.72-7.96	0.146-3.858	6.91-7.99	0.017-0.034
11	15.12.2015-21.12.2015	6.69-8.61	0.068-3.968	6.95-8.29	0.024-0.039
12	22.12.2015-30.12.2015	6.75-8.20	0.358-3.808	6.99-8.31	0.007-0.039
13	01.01.2016-07.01.2016	6.76-8.59	0.091-2.783	7.03-8.27	0.004-0.033
14	08.01.2016-14.01.2016	6.36-8.11	0.264-2.923	6.99-8.61	0.009-0.032
15	15.01.2016-21.01.2016	6.73-8.91	0.059-1.596	7.03-8.28	0.009-0.035
16	22.01.2016-31.01.2016	7.09-8.69	0.048-1.964	8.07-8.35	0.010-0.036
17	01.02.2016-07.02.2016	7.64-8.16	0.389-1.767	8.19-8.45	0.007-0.033
18	08.02.2016-14.02.2016	6.81-8.13	0.239-2.973	8.01-8.40	0.006-0.039
19	15.02.2016-22.02.2016	7.24-8.13	0.368-3.739	8.14-8.58	0.010-0.038
20	23.02.2016-29.02.2016	7.70-8.20	0.507-3.553	8.16-8.42	0.002-0.039
21	01.03.2016-07.03.2016	7.49-8.29	0.474-4.102	6.88-8.40	0.002-0.041
22	08.03.2016-15.03.2016	7.68-8.20	0.733-4.631	8.14-8.43	0.013-0.039



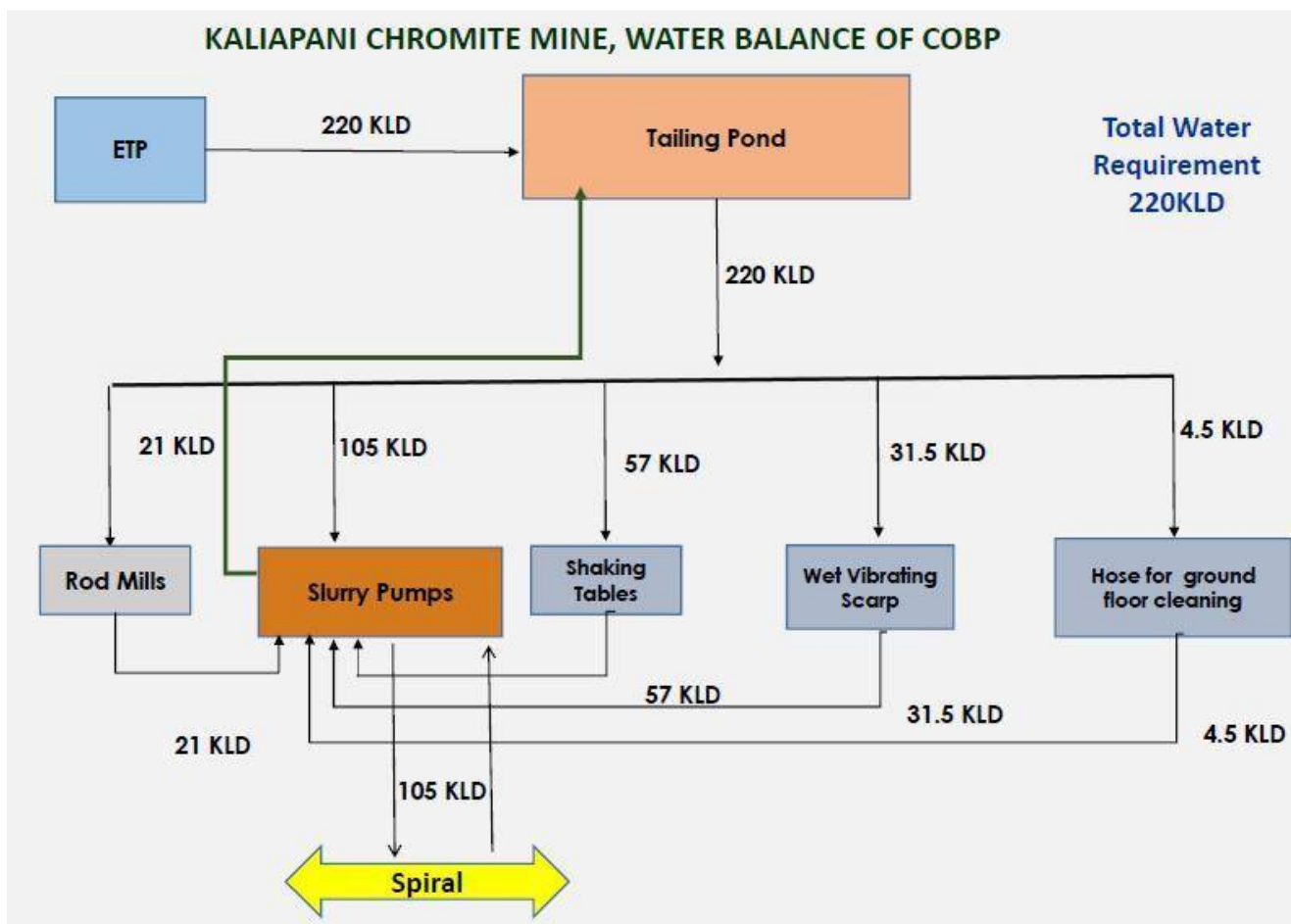
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23	16.03.2016-23.03.2016	7.63-8.47	1.076-4.243	7.95-8.44	0.011-0.033
24	24.03.2016-31.03.2016	7.23-8.24	0.536-4.806	7.32-8.86	0.006-0.029

xviii. The decanted water from the beneficiation plant and slime/tailing pond shall be re circulated within the mine and there shall be zero discharge from the mine.

Status- Total decanted water from the beneficiation plant & tailing/slime pond is reused in COB plant; hence no discharge of decanted effluents from the same. The water balance of the beneficiation plant is given below.



xix. Regular monitoring of the flow rate of the springs and perennial nallahs shall be carried out and records maintained.

Status- The flow rate of Damsala Nallah is being regularly monitored and record has maintained. The flow rate in post-monsoon (Nov,2015) and Winter Season (Jan,2016) season is given in the **Table-7**.


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xx. **Regular monitoring of water quality, upstream and downstream of natural water bodies shall be carried out and record of monitoring data should be maintained and submitted to Ministry of Environment and Forests, its Regional Office, Bhubaneswar, Central Groundwater Authority, Regional Director, Central Ground Water Board, State Pollution Control Board and Central Pollution Control Board.**

Status- Monitoring of water quality, upstream and downstream of natural water bodies i.e Damsala Nallah is being carried out on quarterly basis and report submitted to Ministry of Environment and Forests & CC Regional Office, Bhubaneswar, Central Ground Water Board & State Pollution Control Board on regular basis. The analysis report of the same is given in **Table-13.**

[Table- 13: Surface water analysis result]

Kaliapani Chromite Mines M/s BALASORE ALLOYS LTD SURFACE WATER QUALITY Period-Post Monsoon (NOVEMBER 2015) Date of Sampling:03.11.2015						
SI No.	PARAMETERS	Unit	STANDARDS	Results of Post monsoon period - 2015-16		
			(IS:2296 CLASS C)	SW1	SW2	SW3
1	Colour	Hazen	300	Colourless	Colourless	Colourless
2	pH	....	6.5-8.5	6.45	6.94	7.16
3	Iron as Fe	mg/l	50	0.4	0.45	0.38
4	Chloride (as Cl)	mg/l	600	14.7	13.2	16.2
5	Fluoride as F	mg/l	1.5	0.1	0.12	0.15
6	Total Dissolved Solids	mg/l	1500	116	108	126
7	Total Suspended Solids	mg/l	.....	36	45	52
8	Manganese(as Mn)	mg/l	.....	0.05	0.033	0.04
9	Sulphates(as SO ₄)	mg/l	400	12.8	16.4	17.6
10	Nitrate(as NO ₃)	mg/l	50	0.38	0.3	0.44
11	Phenolic Compound as C ₆ H ₅ OH	mg/l	0.005	BDL	BDL	BDL
12	Mercury(as Hg)	mg/l	.....	BDL	BDL	BDL
13	Cadmium(as Cd)	mg/l	0.01	BDL	BDL	BDL
14	Chromium(as Cr+6)	mg/l	0.05	0.038	0.024	0.02
15	Total Chromium	mg/l	0.5	0.4	0.36



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16	Selenium(as Se)	mg/l	0.05	BDL	BDL	BDL
17	Arsenic(as As)	mg/l	0.2	BDL	BDL	BDL
18	Cyanide(as CN)	mg/l	0.05	BDL	BDL	BDL
19	Lead(as Pb)	mg/l	0.1	BDL	BDL	BDL
20	Zinc (as Zn)	mg/l	15	BDL	BDL	BDL
21	Nickel as Ni	mg/l	.....	0.28	0.36	0.2
22	Oil & Grease	mg/l	0.1	ND	ND	ND
23	Free Ammonia (NH ₃)	mg/l	.....	0.14	0.16	0.1
24	Coliform Organism	MPN/100ml	5000	165	144	142
25	Bio-Assay Test	.....	90% of survival of fish after 96 hours in 100% effluent	98.00%	98.00%	98.00%
26	Dissolved Oxygen as O ₂	mg/l	4	5.5	5.8	6
27	BOD, 3 days at 27°C	mg/l	3	1.6	2.4	2
28	COD	mg/l	.....	5.2	6	5.8
29	Electrical Conductivity	µmhos/ms	.....	119	110	132
30	Phosphorous as P	mg/l	.....	0.26	0.28	0.34

Period-Winter (JANUARY 2016)

Date of Sampling: 11.01.2016

SI No.	PARAMETERS	Unit	STANDARDS	Results of Winter period -2015-16		
			(IS:2296 CLASS C)	SW1	SW2	SW3
1	Colour	Hazen	300	Colourless	Colourless	Colourless
2	pH	....	6.5-8.5	6.85	7.14	7.36
3	Iron as Fe	mg/l	50	0.44	0.52	0.42
4	Chloride (as Cl)	mg/l	600	15.4	14.6	15
5	Fluoride as F	mg/l	1.5	0.06	0.08	0.12
6	Total Dissolved Solids	mg/l	1500	136	122	146
7	Total Suspended Solids	mg/l	46	58	62


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8	Manganese(as Mn)	mg/l	0.051	0.038	0.047
9	Sulphates(as SO ₄)	mg/l	400	15.4	14.6	14.2
10	Nitrate(as NO ₃)	mg/l	50	0.42	0.34	0.48
11	Phenolic Compound as C ₆ H ₅ OH	mg/l	0.005	BDL	BDL	BDL
12	Mercury(as Hg)	mg/l	.....	BDL	BDL	BDL
13	Cadmium(as Cd)	mg/l	0.01	BDL	BDL	BDL
14	Chromium(as Cr+6)	mg/l	0.05	0.04	0.038	0.03
15	Total Chromium	mg/l	.....	0.48	0.58	0.6
16	Selenium(as Se)	mg/l	0.05	BDL	BDL	BDL
17	Arsenic(as As)	mg/l	0.2	BDL	BDL	BDL
18	Cyanide(as CN)	mg/l	0.05	BDL	BDL	BDL
19	Lead(as Pb)	mg/l	0.1	BDL	BDL	BDL
20	Zinc (as Zn)	mg/l	15	BDL	BDL	BDL
21	Nickel as Ni	mg/l	.....	0.4	0.32	0.24
22	Oil & Grease	mg/l	0.1	ND	ND	ND
23	Free Ammonia (NH ₃)	mg/l	.....	0.11	0.10	0.14
24	Coliform Organism	MPN/100ml	5000	175	164	182
25	Bio-Assay Test	.....	90% of survival of fish after 96 hours in 100% effluent	98.00%	98.00%	98.00%
26	Dissolved Oxygen as O ₂	mg/l	4	5.2	5.4	6.4
27	BOD, 3 days at 27°C	mg/l	3	1.6	2	2.6
28	COD	mg/l	.....	5.6	6.4	5.4
29	Electrical Conductivity	µmhos/ms	114	120	122
30	Phosphorous as P	mg/l	0.28	0.26	0.32



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STATION	CODE	CO-ORDINATE	RL
DAMSALA NALLAH NEAR CHIRIGUNIA U/S	SW1	N21°02'39.1" E85°46'21.4"	102
DAMSALA NALLAH NEAR CHINGUDIAPALA D/S	SW2	N21°02'8.8" E85°44'27.8"	84
NEAR MINE BOUNDARY DISCHARGE	SW3	N21°02'18.1" E85°45'33.2"	81

ABBREVIATIONS
SW- SURFACE WATER
U/O- UNOBJECTIONABLE
CL- COLOURLESS
ND- NOT DETECTED
BDL- BELOW DETECTION LIMIT

xxi. **Suitable rainwater harvesting measures on long term basis shall be planned and implemented in consultation with Regional Director, Central Ground Water Board.**

Status- Rooftop rain water harvesting structure has implemented to augment ground water resources in the area in consultation with the Regional Director, Central Ground Water Board. Photo of the same is given as **Photo-7**. Another rooftop rain water harvesting structure construction proposal is in progress. The copy of schematic diagram of proposed structure attached as **Annexure-IV**

xxii. **Vehicular emissions shall be kept under control and regularly monitored. Measures shall be taken for maintenance of vehicles used in mining operations and in transportation of mineral from mine face to the beneficiation plant. The vehicles shall be covered with a tarpaulin and shall not be overloaded.**

Status- Periodical maintenance of the vehicles used in mining operations and in transportation of mineral from mine face to the beneficiation plant is being ensured. Regular monitoring of vehicular emission also being done . For outside trucks carrying mineral from mine to plant are ensured valid Pollution Under Control Certificate. The transporting trucks are being covered with tarpaulin and are allowed to take only the prescribed load i.e. below 10.5 Ton. Sample copy of the PUC certificate of truck carrying material is attached as **Annexure-V & Vehicular emission report given in table -14**. Photographs showing vehicles covered with tarpaulin is given as **Photo-11**.



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Table:-14: Vehicular Emission Result

Sl.No.	Vehicle No.	Engine Make & Model	CO (%)	HC (ppm)	NOx (%)	Smoke (HSU)
1	OD-04-B-8780	MAN D-0836	0.010	63	25.38	34.56
2	OD-04-B-8779	MAN D-0836	0.016	82	34.21	42.58
3	OD-04-B-8782	MAN D-0836	0.027	56	32.58	55.01
4	OD-04-B-8778	MAN D-0836	0.047	86	39.47	56.55
5	OD-04-B-8784	MAN D-0836	0.066	35	40.52	61.25
6	OD-04-B-8785	MAN D-0836	0.053	42	22.96	44.37
7	OD-04-B-8781	MAN D-0836	0.062	97	32.30	36.21
8	OD-04-B-8783	MAN D-0836	0.081	67	25.57	33.41
9	OD-04-B-8776	MAN D-0836	0.116	112	48.21	56.84
10	OD-04-B-8777	MAN D-0836	0.024	46	23.58	32.12
Standard			3.0	1500	--	65

PHOTO- 11: SHOWING VEHICLE COVERED WITH TARPAULINE



xxiii. Sewage treatment plant shall be installed for the colony. ETP shall also be provided for workshop and wastewater generated during mining operation.

Status- We have no colony within the lease area. However for the treatment of the canteen waste water and organic waste STP of 40 KLD capacity is installed at site .The photo of same is given as Photo 12. The waste water generated during mining operation is properly treated through an up graded Effluent Treatment Plant of capacity 445 KL/Hr established with the recommendation of IIT, Kharagpur. The treated water has been monitored on daily basis and meeting the prescribed standards before reuse/discharge.

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Oil and Grease trap has been Installed at discharge of workshop effluents which is working efficiently. Photo of same is given as **Photo-13**.

Photo-12 Oil & Grease Trap at Service Centre



PHOTO-13: SHOWING VEHICLE SERVICING CENTER WITH OIL & GREASE TRAP



xxiv. Digital processing of the entire lease area using remote sensing technique shall be carried out regularly once in three years for monitoring land use pattern and report submitted to Ministry of Environment and Forests and its Regional Office, Bhubaneswar.

Status- Digital processing of the entire lease area using remote sensing technique is carried out


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for monitoring land use pattern and the report & Map is given below .

AREA STATISTICS		
SL.NO	LAND FEATURE	AREA IN Ha
1	MINING AREA	10.601
2	QUARRY	21.577
4	DUMP	30.047
TOTAL AREA		62.225



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**DGPS SURVEYED MAP OF KALIAPANI CHROMITE MINES
OVER AN AREA 153.76 Ac. OR 62.225 Ha.
M/S BALASORE ALLOYS LTD. UNDER SUKINDA TAHASIL OF JAJPUR DISTRICT, ODISHA.**



SCALE - 1:4,000



XXV.



CO-ORDINATES SURVEYED BY DGPS

SLNO	PILLAR ID	LONGITUDE	LATITUDE	EASTING	NORTHING
1	DUMP-1	85°45'51.2865"	21°02'01.4374"	37166.734	232897.807
2	DUMP-1	85°45'41.2265"	21°01'55.7854"	371472.543	2328024.580
3	DUMP-1	85°45'36.3241"	21°01'51.8513"	371243.380	2328076.119
4	DUMP-1	85°45'36.2887"	21°01'56.7733"	371168.819	2328013.807
5	DUMP-1	85°45'35.7387"	21°01'56.7523"	371064.284	2328033.273
6	DUMP-2	85°45'42.4571"	21°02'01.8038"	371362.854	2328050.852
7	DUMP-2	85°45'52.3754"	21°02'02.3287"	371245.518	2328442.238
8	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
9	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
10	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
11	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
12	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
13	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
14	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
15	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
16	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
17	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
18	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
19	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
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23	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
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26	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
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32	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
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35	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
36	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
37	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
38	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
39	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
40	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
41	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
42	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
43	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
44	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
45	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
46	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
47	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
48	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
49	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
50	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
51	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
52	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
53	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
54	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
55	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238
56	DUMP-2	85°45'52.3283"	21°02'02.3287"	371245.518	2328442.238

AREA STATISTICS

SLNO	LAND FEATURE	AREA IN Ha
1	MINING AREA	10.602
2	QUARRY	21.577
4	DUMP	30.047
TOTAL AREA		62.225

CO-ORDINATES OF ML PILLAR

PILLAR ID	LONGITUDE	LATITUDE	EASTING	NORTHING
ML-A	85°45'29.21891"	21°02'05.84938"	370855.080	2328516.513
ML-B	85°45'39.48908"	21°01'50.87978"	371247.864	2328049.881
ML-C	85°45'57.08288"	21°02'01.48243"	371757.866	2328528.272
ML-D	85°46'16.28888"	21°01'33.81426"	372309.286	2325622.070
ML-E	85°46'21.27987"	21°01'36.84485"	372450.894	2325836.987
ML-F	85°46'28.12122"	21°01'40.85713"	372648.447	2325731.771
ML-G	85°46'07.85089"	21°02'11.18513"	372071.505	2328874.021
ML-H	85°46'44.10137"	21°01'57.86178"	371582.899	2328263.202
ML-I	85°46'35.89543"	21°02'06.84578"	371148.720	2328659.980
INT-A1	85°46'30.78423"	21°02'03.55887"	370899.289	2328647.823
INT-A2	85°46'34.88411"	21°01'57.13256"	371119.375	2328240.280
INT-B1	85°46'44.27819"	21°01'53.82463"	371588.838	2328136.338
INT-B2	85°46'50.36168"	21°01'57.18734"	371583.204	2328127.823
INT-C1	85°46'02.78547"	21°01'53.22460"	371621.243	2328122.802
INT-C2	85°46'06.58873"	21°01'47.87978"	372028.816	2328957.898
INT-C3	85°46'11.70295"	21°01'46.50275"	372175.451	2328926.685
INT-F1	85°46'24.57373"	21°01'46.09328"	372548.213	2328588.745
INT-F2	85°46'18.73258"	21°01'54.79943"	372381.746	2328174.776
INT-F3	85°46'13.16281"	21°02'02.19743"	372222.850	2328427.234
INT-G2	85°45'55.17993"	21°02'02.81403"	371648.002	2328419.800
INT-H1	85°45'41.72103"	21°02'01.18569"	371314.828	2328372.703

Boya
16/12/15
DIO Deputy Director Mines
Jajpur Road

Deena
16/12/15
REVENUE INSPECTOR
KANKADPAL

Prasanna
16/12/15
Forest Inspector
Rajpur Section

M/S
Tahasildar
SUKINDA

Smt. J.
Forest Range Officer
Sukinda Range

D. K. S.
Divisional Forest Officer
Cuttack Forest Division.

LEGEND

- ML PILLAR
- DUMP
- ML BOUNDARY
- DUMP AREA
- QUARRY

DGPS SURVEY CONDUCTED BY

Akashdeep

DIGITAL CARTOGRAPHY AND SERVICES (DCS) PVT.LTD.

1015, Bhagabati Sankhan,
GGP Canal Road, Rasulpur, Bhubaneswar-75

[Signature]

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Pre-placement medical examination and periodical medical examination of the workers engaged in the project shall be carried out and records maintained. For the purpose, schedule of health examination of the workers should be drawn and followed accordingly.

Status- Pre-placement medical examination and periodical medical examination of the workers engaged in the project is being carried out and records maintained. The details of IME & PME is given in **Table-15**.

[Table-18: Details of IME & PME status]

KALIAPANI CHROMITE MINES,M/S BALASORE ALLOYS LIMITED					
DETAILS OF IME /PME CARRIED OUT DURING 2015-16					
COMPANY NAME	M POWER	IME DONE	PME DONE	IME DUE	PME DUE
BAL	225	127	67	4	27
SUKANTA NAYAK	33	33	0	0	
G.C.MOHANTA	250	170	0	0	80
BISWAJIT NAYAK	23	23	0	0	
M.DAS	25	25	0	0	
S.B. TRIPATHY	1	1	0	0	
ACTION SECURITY	44	40	0	4	
CREDENCE	329	322	0	3	4
TOTAL	930	741	67	11	111

xxvi. The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered fauna spotted in the study area. Action plan for conservation of flora and fauna shall be prepared and implemented in consultation with the State Forest and Wildlife Department. Necessary allocation of funds for implementation of the conservation plan shall be made and the funds so allocated shall be included in the project cost. All the safeguard measures brought out in the Wildlife Conservation Pan so prepared specific to the project site shall be effectively implemented. A copy of action plan shall be submitted to the Ministry of Environment and Forests and its Regional Office, Bhubaneswar.

Status- Site Specific Wildlife Conservation Plan has been prepared and approved by PCCF(WL) & Chief Wild Life warden ,Odisha Vide Memo 8478/1WL(C)-SSP-425/2014 Dated 7th Nove-2014. Copy of same is attached as **Annexure- VI**.

In addition to that a sum of Rs 27,71,909/- was deposited towards payment for implementation of Regional Wildlife Management Plan. Acknowledgement regarding the same is given in **Annexure VII**.

xxvii. A Final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.

Status- Final Mine Closure Plan will be submitted to the ministry 5 years before the anticipated final mine closure.



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xxviii. The project proponent shall undertake all the commitments made during the public hearing and effectively address the concerns raised by the locals in the public hearing as well as during consideration of the project, while implementing the project.

Status- All the commitments made during public hearing are being undertaken by incorporating in the CSR activities. There was expenditure of Rs 67.60 lakh incurred during 2015-16 toward various activities under CSR . The photos of the same is shown as **photo-14**.

Photo-14 (Photos Showing CSR Activities)



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General Conditions & their Status:

- i. **No change in Chrome Ore Processing/Beneficiation technology and scope of working should be made without prior approval of the Ministry of Environment & Forests.**

Status- Chrome ore Mining method practiced in the project is both opencast & underground fully mechanized. There is/will be no change in Chrome Ore Processing/Beneficiation technology and scope of working shall be made without prior approval of the Ministry of Environment & Forests.

- ii. **No change in the calendar plan including Processing/Beneficiation of mineral chrome ore and waste should be made.**

Status- No change in the calendar plan including Processing/Beneficiation of mineral chrome ore and waste shall be made.

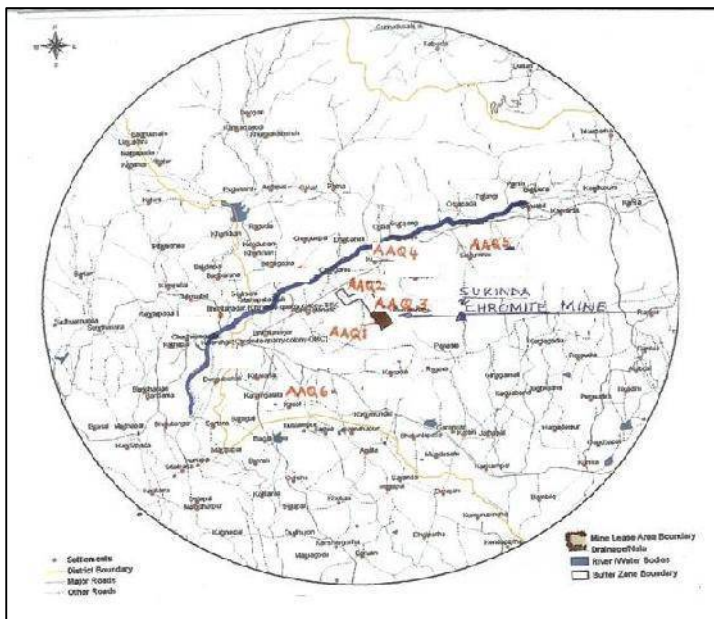
- iii. **At least four ambient air quality-monitoring stations should be established in the core zone as well as in the buffer zone for RSPM (Particulate matter with size less than 10 micron i.e., PM10) and NOX monitoring. Location of the stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board. The data so recorded should be regularly submitted to the Ministry including its Regional office located at Bhubaneswar and the State Pollution Control Board / Central Pollution Control Board once in six months.**

Status- Air quality monitoring for the parameters viz PM10, PM2.5, SO₂, NO_x, CO, NH₃ & O₃ are being done by establishing 6 ambient air monitoring stations on the basis of meteorological data,

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topographical features after consultation with SPCB in the core & Buffer zone. The data so recorded is being regularly submitted to the Ministry including its Regional office located at Bhubaneswar and the State Pollution Control Board / Central Pollution Control Board once in six months. The monitoring data for the period Oct'15 to March'16 is given in **Table-4**.

Location showing AAQ monitoring stations shown given below



- iv. **Measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operations of HEMM, etc. should be provided with ear plugs / muffs.**

Status- Maintenance of all HeMM are being carried out on regular basis to suppress the Noise generation. Regular monitoring is being carried out for noise level in the work environment. Ear plugs / muffs are provided to all workers engaged in operations of HEMM etc. Noise level monitoring results are given below in **Table 16**.

Photographs showing use of PPEs are given as **Photo-15**.

**KALIAPANI CHROMITE MINES, M/s BALASORE ALLOYS LTD
Noise Level Monitoring Report**

Sl No	Location	Station Code	Oct,15		Nove,15		Dec,15		Jan,16		Feb,16		March,16	
			Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Buffer Zone Ambient Noise (Results in dBA) Norm : Day-55, Night-45														
1	Mines Office	ANL 1	48.8	31.9	46	32	47.3	30.8	44.6	30.8	43.8	30.6	45.7	31.2
2	Village Kaliapani	ANL 2	48.6	32	49.1	33	46.5	31.3	41.9	33	45.7	31.8	47.4	31.9
3	Village Sukrangi	ANL 3	43.5	30.3	44.5	30.8	43.9	29.8	41.9	29.5	42.9	32.1	44.8	31.8

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4	Village Ransol	ANL 4	45.5	31.4	44.2	32.3	46.6	31.5	45.7	33.8	43.8	33.1	46	31.8
5	Village Tisco Hutting	ANL 5	46.9	31.9	49	32.4	46.5	32.7	47.7	31.2	46.9	33.7	47.3	33.6
Core-Zone Work zone (Results in dBA) Norm:Day:75, Night:70														
1	O/C Quarry	WNL 1	64.4	62	64.6	62.1	66.5	64	63.9	59.4	61	58.9	60.6	57.8
2	Dumper Operation	WNL 2	70.9	68.1	71.1	68.8	69.4	65.8	68.4	63	66.8	64.1	67.8	65.8
3	Loader Operation	WNL 3	71.1	67.2	70	68.2	68.1	66.5	70.4	67.9	69.6	66.9	71	67.1
4	DG Set	WNL 4	69.8	68.1	68.8	67.8	67.9	65.5	68.4	66	67.9	66.5	68.7	66.9
5	Electric Pump	WNL 5	65.9	64.8	65.8	64.8	65.8	64.7	64.7	64.2	67	65.8	64.7	62.2
6	Loading Point	WNL 6	65.4	61.5	65.3	63.1	67.8	64.2	69.8	64.9	69.3	66.3	67.1	66.2
7	COB Plant	WNL 7	69.5	64	67.8	65.9	66.9	63.1	69.9	63.9	65.8	64.3	66.8	65.7
8	Drilling Machine	WNL 8	64.4	62	64.6	62.1	66.5	64	63.9	59.4	61	58.9	60.6	57.8

Photo-16: SHOWING WORKERS WORKING WITH PPE



[Handwritten signature]

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v. **There will be zero waste water discharge from the plant.**

Status- Total decanted water from the beneficiation plant & tailing/slime pond is reused in COB plant; hence there is zero waste water discharge from the plant.

vi. **Personnel working in dusty areas should wear protective respiratory devices and they should also be provided with adequate training and information on safety and health aspects.**

Status- Personal protective equipments are being provided to all workers respective to the nature of the job. Initial and periodical awareness training is being imparted to all workers in the Company's Vocational Training Centre located within the lease area on Safety and Health Aspects. Periodical health check up as per DGMS guideline is being carried out for all employees .

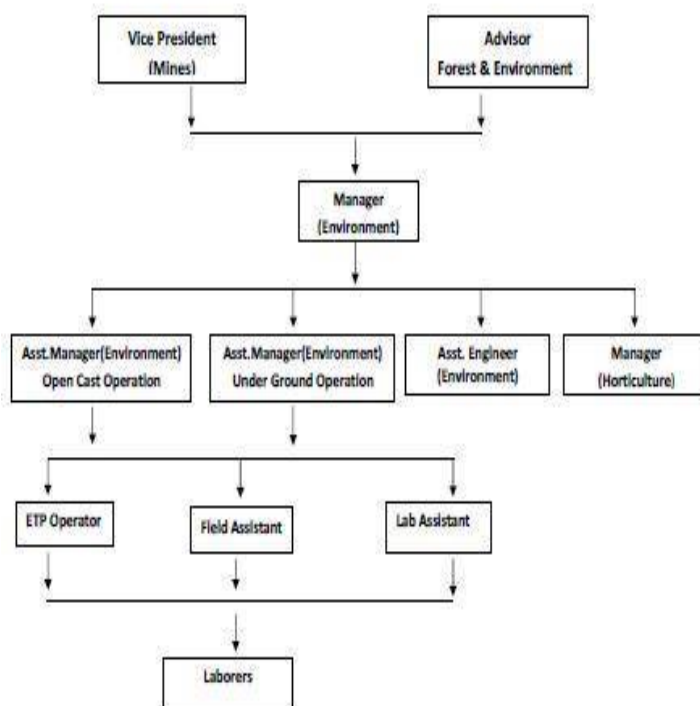
vii. **Occupational health surveillance program of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed.**

Status- Pre-placement medical examination and periodical medical examination of the workers engaged in the project is being carried out and records maintained for corrective measures.

viii. **A separate environmental management cell with suitable qualified personnel should be set-up under the control of a Senior Executive, who will report directly to the Head of the Organization.**

Status- A separate Environment management cell under the control of President (Mines) has been set up. Organizational Chart of Environmental Management Cell is given below.

Organization chart showing Environment Management Cell



ix. The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year wise expenditure should be reported to the Ministry and its Regional Office located at Bhubaneswar.

Status- Separate funds is being earmarked for environmental protection measures. Year wise Expenditure also been reported to Regional Office, MoEF,BBSR. The detail of the expenditure is given in **Table-17**.

[Table-17: Expenditure on EMP]

Kaliapani Chromite Mines/s Balasore Alloys Ltd			
Details of Expenditure Made Towards Protection of Environment(Rupees in Lakh)			
sl No	Activity	Sub-Activities	April.15 to March,2016
1	Protection Measures for Water Pollution	Fixed type water sprinklers installation/maintenance	0.15
		Dry-fog system installation / maintenance	0.15
		Expenditure towards deployment of water tankers for water sprinkling including recurring expenditure	60
2	Dump Management	Construction /Maintenance of check dams, garlanding drain& Retaining wall,etc	1
		Coirmatting	8.1
		Grass turffing	6.58
3	Plantation	Inside ML area Plantation(Dump slope, Safety zone incl maintenance)	8.05
		Out ML area plantation(Avenue & Block)	14.25
4	Protective Measures for Water Pollution	ETP Operation and Maintenance(incl Chemical Cost)	25.55
		Surface Run Off Management	79
5	Training & Awareness	Training	0.3
		Awareness	0.2
6	Occupational Health & Hygiene	IME/PME	2.08
		Drinking Water facility	5
		Medicine/First aid	2.5
7	Infrastructure	Environmental equipment purchase	50
		Environmental Monitoring Equipment Maintenance	0.13


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8	Environmental Monitoring	Water,Air,Soil, Noise	13.47
9	Other Expenses	Statutory Payment	12
Total			288.51

- x. **The project authorities should inform to the Regional Office located at Bhubaneswar regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.**

Status- This is an ongoing project since Sept' 2000.

- xi. **The Regional Office of this Ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer(s) of the Regional Office by furnishing the requisite data / information/monitoring reports.**

Status- We are abide by the condition and shall extend full cooperation to the officer(s) of regional office by furnishing the requisite data / information/monitoring reports during their monitoring of compliance of the stipulated conditions.

- xii. **The project proponent shall submit six monthly reports on the status of compliance of the stipulated environmental clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the Ministry of Environment and Forests, its Regional Office Bhubaneswar, the respective Zonal Office of Central Pollution Control Board and the State Pollution Control Board. The proponent shall upload the status of compliance of the environmental clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the Ministry of Environment and Forests, Bhubaneswar, the respective Zonal Officer of Central Pollution Control Board and the State Pollution Control Board.**

Status- Six monthly compliance report is being submitted on the status of compliance of the stipulated environmental clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the Ministry of Environment and Forests, its Regional Office Bhubaneswar, the respective Zonal Office of Central Pollution Control Board and the State Pollution Control Board. The status of compliance of the environmental clearance conditions, including results of monitored data is uploaded on company website periodically. The submission details of the six monthly compliance is given in **Table-18**.

[Table-18: The status of six monthly EC compliance submissions]

Period	Letter no.	Date of submission
April,2015 to September,2015	BAL/Mines/387/2015-16	1.12.2015
October 2014 to March 2015	BAL/MINES/2376/2015	28.05.2015
April 2014 to September 2014	BAL/MINES/1825/2014	29.11.2014


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October 2013 to March 2014	BAL/MINES/161	28.05.2014
April 2013 to September 2013	BAL/MINES/394	30.11.2013
October 2012 to March 2013	BAL/MINES/202	14.05.2013
April 2012 to September 2012	BAL/MINES/459	19.11.2012
October 2011 to March 2012	BAL/MINES/198	29.05.2012
April 2011 to September 2011	BAL/MINES/394	18.11.2011
October 2010 to March 2011	BAL/MINES/168	16.05.2011
April 2010 to September 2010	BAL/MINES/358	03.11.2010
October 2009 to March 2010	BAL/MINES/166	25.05.2010
April 2009 to September 2009	BAL/MINES/362	29.10.2009
October 2008 to March 2009	BAL/MINES/134	05.05.2009
April 2008 to September 2008	BAL/MINES/275	19.11.2008

- xiii. A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parisad/ Municipal Corporation, Urban Local Body and the Local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the Company by the proponent.

Status- Copy of the clearance letter has been sent to concerned Panchayat. The clearance letter also been uploaded on the website of the Company. The copy of letter to panchayat is attached as **Annexure-VI**. The URL for the same is http://www.balasurealloys.com/webpage.php?title=Environment+Policy&p_type=1&parent=36&catid=78. The screenshot of the company website showing the clearance letter is given below as **Figure-12**.

Screenshot of company website showing Environment Clearance letter uploaded



- xiv. The State Pollution Control Board should display a copy of the clearance letter at the Regional office, District Industry Centre and the Collector's office/ Tehsildar's Office for 30 days.


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Status- Agreed.

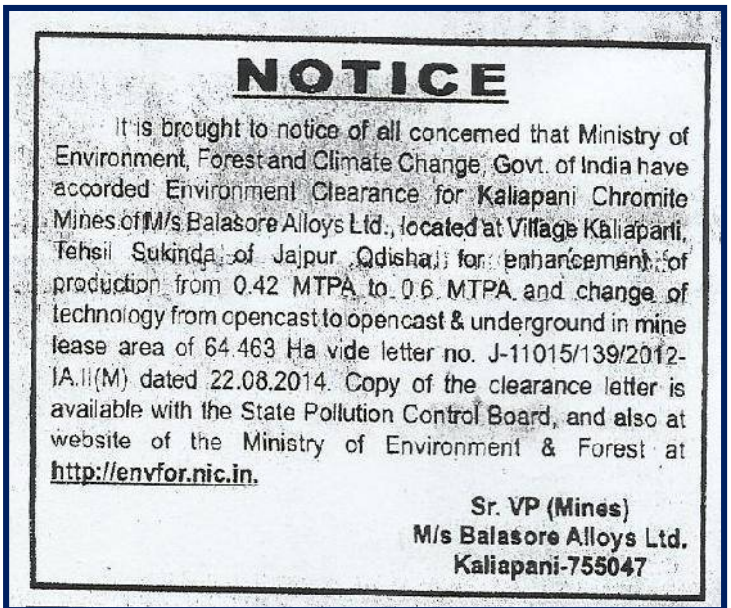
xv. The environmental statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Regional Office of the Ministry of Environment and Forests, Bhubaneswar by e-mail.

Status- The environmental statement for each financial year ending 31st March in Form-V is being submitted to the concerned State Pollution Control Board as prescribed under the

Environment (Protection) Rules, 1986, as amended subsequently, also uploaded on the website of the company along with the status of compliance of environmental clearance conditions and also sent to the respective Regional Office of the Ministry of Environment and Forests, Bhubaneswar by e-mail. The copy of the last environmental statement for financial year ending 31st March 2014-15 is attached as Annexure- VIII. The same report for the year 2015-16 will be submitted by last week of September,2016.

xvi. The project authorities should advertise at least in two local newspapers of the District or State in which the project is located and widely circulated, one of which shall be in the vernacular language of the locality concerned, within 7 days of the issue of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and also at web site of the Ministry of Environment and Forests at <http://envfor.nic.in> and a copy of the same should be forwarded to the Regional Office of this Ministry located at Bhubaneswar.

Status- The clearance letter informing that the project has been accorded environmental clearance is advertised in "The Sambad" (Odia daily) & The Pioneer (English daily) newspaper, the copy of which is shown below.




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ANNEXURE-I: NOC FOR GROUND WATER WITHDRAWAL



Member Secretary

भारत सरकार
केन्द्रीय भूमि जल प्राधिकरण
जल संसाधन मंत्रालय
Government of India
Central Ground Water Authority
Ministry of Water Resources

CGWA/IND/Proj/2013-1408

No.21-4(44)/SER/CGWA/2008- 1845

Dated:-

10 OCT 2013

M/s Balasore Alloys Ltd.,
Kaliapani Chromite Mine
At/Po Kalipani
District Jajpur-755047, Odisha

Sub: - NOC for ground water withdrawal by M/s Balasore Alloys Ltd., in respect of their Kaliapani Chromite Mine located at Village Kalipani, Block & Tehsil Sukinda, District Jajpur, Odisha – reg.

Refer to your letter dated 28.5.2013 on the above cited subject. Based on recommendations of Regional Director, Central Ground Water Board, South Eastern Region, Bhubaneswar vide their office letter no. 5-22/SER/CGWA/2013-758 dated 13.8.2013 & 12.9.2013 and further deliberations on the subject, the NOC of Central Ground Water Authority is hereby accorded to **M/s Balasore Alloys Ltd., in respect of their Kaliapani Chromite Mine located at Village Kalipani, Block & Tehsil Sukinda, District Jajpur, Odisha.** The NOC is, however subject to the following conditions:-

1. The firm may withdraw 294.2 m³/day water for mine dewatering due to intersection of water table by mining activity through suitable ground water withdrawal structures under intimation to the Regional Director, Central Ground Water Board, South Eastern Region, Bhubaneswar. Firm is also permitted to withdraw 53 m³/day for industrial & domestic use through existing one (1) & proposed one (1) borewell (to be kept as standby) and no additional ground water abstraction structures to be constructed for this purpose without prior approval of the CGWA. Thus, the total withdrawal allowed is **347.2 m³/day (not exceeding 1,26,728 m³/year)**.
2. The wells to be fitted with water meter by the firm at its own cost and monitoring of ground water abstraction to be undertaken accordingly on regular basis, at least once in a month. The ground water quality to be monitored twice in a year during pre monsoon and post monsoon periods.
3. **M/s Balasore Alloys Ltd.,** shall, in consultation with the Regional Director, Central Ground Water Board, South Eastern Region, Bhubaneswar implement ground water recharge measures to the tune of **15,000 m³/year** as proposed for augmenting the ground water resources of the area.
4. The photographs of the recharge structures after completion of the same are to be furnished immediately to the Regional Director, Central Ground Water Board, South Eastern Region, Bhubaneswar for verification and under intimation to this office.

West Block - 2, Wing - 3, Sector - 1, R.K. Puram, New Delhi - 110066
Tel : 011-26175362, 26175373, 26175379 • Fax : 011-26175369
Website : www.cgwb.gov.in, www.mowr.gov.in

स्वच्छ सुरक्षित जल - सुन्दर खुशहाल कल
CONSERVE WATER - SAVE LIFE

MINES MANAGER

KALIAPANI CHROMITE MINES
BALASORE ALLOYS LTD.

ANNEXURE-II: CONSENT TO ESTABLISH FROM SPCB, ODISHA



BY REGD POST

OFFICE OF THE
STATE POLLUTION CONTROL BOARD, ODISHA
Parivesh Bhawan, A/118, Nilakantha Nagar, Unit-VIII,
Bhubaneswar - 751 012

No. 18196/

IND-II-NOC-5723

Date 08-10-13

OFFICE MEMORANDUM

In consideration of the application for obtaining Consent to Establish for **Kaliapani Chromite Mines of M/s Balasore Alloys Ltd.**, the State Pollution Control Board has been pleased to convey its Consent to Establish under section 25 of Water (Prevention & Control of Pollution) Act, 1974 and section 21 of Air (Prevention & Control of Pollution) Act, 1981 for enhancement of production capacity of Chrome ore from 0.42 MTPA to 0.6 MTPA and Change of mining from opencast to underground mining, over mining lease hold area of 64.463 ha., At - Kaliapani, Sukinda in the district of Jajpur with the following conditions.

GENERAL CONDITIONS:-

1. This consent to establish is valid for the product, method of mining and capacity mentioned in the application form. This order is valid for five years, which means the proponent shall commence mining activities for the proposal within a period of five years from the date of issue of this consent to establish order. If the proponent fails to commence mining activities for the proposal within five years then a renewal of this consent to establish shall be sought by the proponent.
2. Adequate effluent treatment facilities are to be provided such that the quality of sewage and trade effluent satisfies the standards as prescribed under Environment Protection Rule, 1986 or as prescribed by the Central Pollution Control Board and/or State Pollution Control Board or otherwise stipulated in the special conditions.
3. All emission from the mining activities as well as the ambient air quality and noise shall conform to the standards as laid down under Environment (Protection) Act, 1986 or as prescribed by Central Pollution Control Board/State Pollution Control Board or otherwise stipulated in the special conditions.
4. Appropriate method of disposal of solid waste is to be adopted to avoid environmental pollution.
5. The mine shall comply to the provisions of Environment Protection Act, 1986 and the rules made there under with their amendments from time to time such as the Hazardous Waste (Management, Handling & Transboundary Movement) Rules 2008, Hazardous Chemical Rules /Manufacture, Storage and Import of Hazardous Chemical

ANNEXURE-III COPY OF CONSENT TO OPERATE



CONSSENT ORDER
KALIAPANI CHROMITE MINES OF M/S. BALASORE ALLOYS LTD.

Page 1 of 12

BY REGD. POST WITH AD

STATE POLLUTION CONTROL BOARD, ODISHA

A/118, Nilakantha Nagar, Unit-VIII, Bhubaneswar-751012

Phone-2561905, Fax: 2562822, 2560955 E-mail: paribeshi@ospboard.org, Website: www.ospboard.org

CONSSENT ORDER

No. 4712 / IND-I-CON-2576 Dt. 17.3.16

CONSSENT ORDER NO. 1239

Sub: Consent for discharge of sewage and trade effluent under section 25/26 of Water (PCP) Act, 1974 and for existing / new operation of the plant under section 21 of Air (PCP) Act, 1981.

Ref: Your online application No. 432290 dated 11.12.2015 and your online reply dated 9.3.2016

Consent to operate is hereby granted under section 25/26 of Water (Prevention & Control of Pollution) Act, 1974 and under section 21 of Air (Prevention & Control of Pollution) Act, 1981 and rules framed thereunder to

Name of the Industry: KALIAPANI CHROMITE MINES OF M/S. BALASORE ALLOYS LTD.

Name of the Occupier & Designation: SRI BACHCHAN KUMAR, SR. VICE PRESIDENT (MINE)

Address: AT/PO: KALIAPANI, DIST: JAJPUR

This consent order is valid for the period up to 30.09.2016

This consent order supersedes the earlier consent order issued vide letter No. 557 dated 12.01.2015.

Details of Products Manufactured

Sl. No	Product	Quantity
01.	Chrome ore(ROM)	0.6 MTPA

Details of Mineral Handling/Processing Plants

01.	COB Plant of capacity	1x20 TPH
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This consent order is valid for the specified outlets, discharge quantity and quality, specified chimney/stack, emission quantity and quality of emissions as specified below. This consent is granted subject to the general and special conditions stipulated therein.

MINES MANAGER

**KALIAPANI CHROMITE MINES
BALASORE ALLOYS LTD.**

ANNEXURE-V COPY OF PUC CERTIFICATE

1370

COMPUTERISED EMISSION TEST CERTIFICATE

Authorised By : Transport Dept, Govt. of Orissa
[See Rule 119-A (B) (B) of O.M.V. Rules, 1993]
NAYAK POLLUTION TESTING CENTER
SUNGUDA, CHANDIKHOLE, DIST-JAJPUR ORISSA
Licence No-S.T.A./C.T.C./Poll/03/2004


Vehicle Pass Certificate


HSU/Pass	85
HSU/Avg.	12.0
PUC/CO	28494
Reg. No	OR09E 0423
Reg Year	2004
Make	TATA
Model	1613
Yeh Type	TRUCK
Fuel	DIESEL
Test Date	10/May/2016
Test Time	00:57:40 PM
Valid Till	10-Nov-2016
Owner Name	SANATAN ROU

This Vehicle meets the Emission Standards Prescribed by Rule 115(2) of Central motor Vehicle Rules, 1980 and accordingly the Certificate is valid for Six months.

TEST RESULTS:

Flushing Cycle						
Avg.	RPM Min.	RPM Max.	Temp.			
	799	2245	78			
S.No.	RPM Min.	RPM Max.	Km ^h	HSU%	Temp.	
1	745	2145	0.20	8.97%		
2	722	2150	0.20	9.03%		
3	745	2195	0.20	8.97%		
4	769	2005	0.20	8.97%		
Mean	Pass		0.33	12.0		

Tested by:  TUSHAR KANTA NAYAK



4462

COMPUTERISED EMISSION TEST CERTIFICATE

AUTHORISED BY :
CENTRE
MAA CHANDI POLLUTION TESTING CENTRE
KALIAPANI, JAJPUR, ODISHA

ID Number : OR005063	Licence No. : STA-CTC-POLL-05/2014
Year Of Registration : 1996	Date : 14-MAY-2016
Vehicle Registration No. : OR09A-0331	Time : 07:00AM
Engine Make : Reading (Kms) : 0	Owner : B MAHANTA
Engine Number : 1151	Driver : D
Chassis Number : 6359	
Vehicle Make : IED	Fuel : Diesel
Vehicle Make : TATA	Sink cell Temp : 58.0
Vehicle Model : TATA-1612-TC	Oil Temp : 106.0
Type Of Vehicle : GVH Test Station Code : 123	Valid Up To : 13-NOV-2016
Test Result : Free Acceleration	Grade : A
	Validity : 6 Months

Rev. of K	KvAl	Min Rpm	Max Rpm	Interval	Oil Temp	Test Time
1	0.15	1750	1740	2.8	82.0	09:23:34
2	0.15	1970	1750	2.8	82.0	09:23:45
3	0.15	1900	1850	2.8	82.0	09:23:55
4	0.15	1800	1610	2.8	82.0	09:24:05
5	-	-	-	-	-	-
6	-	-	-	-	-	-
7	-	-	-	-	-	-
8	-	-	-	-	-	-
9	-	-	-	-	-	-
10	-	-	-	-	-	-
K_Avg	0.15					
HSU	6.24					

Certified that this vehicle's K-Mean and HSU% value conform to the standards prescribed under Rule 115(2) of CMV Rules 1993. The certificate is valid for 6 months.

MAA CHANDI POLLUTION TESTING CENTRE, KALIAPANI, JAJPUR

MAA CHANDI POLLUTION TESTING CENTRE, KALIAPANI, JAJPUR

MINES MANAGER
KALIAPANI CHROMITE MINES
BALASORE ALLOYS LTD.

ANNEXURE-VI: APPROVAL LETTER OF SITE SPECIFIC WILDLIFE CONSERVATION PLAN

OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS (WILDLIFE)
& CHIEF WILDLIFE WARDEN, ODISHA, BDA APARTMENT, 5TH FLOOR,
PRAKRUTI BHAWAN, NILAKANTHA NAGAR, BHUBANESWAR-12
Ph. No.0674-2564587, FAX No.0674-2565062
(Website:odishawildlife.org, E. mail: odishawildlife@gmail.com)

Memo No. 8175 11 WL(C)SSP-425/2014
Dated, Bhubaneswar, the 7th Nov, 2014

To

The Principal Chief Conservator of Forests, Odisha,
Bhubaneswar

Sub: *Site specific Wildlife Conservation Plan in respect of Kaliapani Chromite Mines of M/s Balasore Alloys Ltd. in Jajpur District under Cuttack Forest Division*

It is to inform you that M/s Balasore Alloys Ltd. has to implement a site specific wildlife conservation plan for its Kaliapani Chromite Mine in Jajpur District, Odisha in compliance to the General condition No.(iii) stipulated in the Environment Clearance granted by Govt. of India, MoEF vide their letter No.J-11015/341/2006-IA.II(M) dt 3.7.2007.

2. The Site Specific Wildlife Conservation Plan in respect of the above project in Cuttack Forest Division has been approved by the undersigned with financial forecast of **₹254.18 lakh** (Rupees two crore fifty-four lakh eighteen thousand) only for the following activities.

- | | |
|---|--------------|
| (i) For activities to be implemented in project area by the User Agency in Cuttack Division | ₹64.82 lakh |
| (ii) For activities to be implemented by DFO, Cuttack Division in project impact area | ₹189.36 lakh |


Grand Total: ₹254.18 lakh

3. Various activities in the lease hold area will be executed by the Project proponent under the guidance of the Divisional Forest Officer, Cuttack Divn. A sum of ₹189.36 lakh only may be deposited in the CAMPA fund meant for the purpose for implementation of various activities within the project impact area by the Forest Deptt. as envisaged in the plan.

4. The User Agency may be advised to note the following conditions for future compliance.

- This Plan may be revisited after 5 years and the User Agency will give undertaking to contribute towards the revised cost of the conservation plan till the project period, if any.
- The project proponent has to prepare and submit the Conservation Plan for the next 10 years of their lease period (balance period for which forest land remains diverted) at least one year before the expiry of the present Conservation Plan and deposit the outlay amount upon its approval. In case of delay, the project operation will be automatically stopped.

Encl: 2 copies of approved site specific WL Conservation Plan


Principal Chief Conservator of Forests (WL)
& Chief Wildlife Warden, Odisha

P T O

**MINES MANAGER
KALIAPANI CHROMITE MINES
BALASORE ALLOYS LTD.**

ANNEXURE-VI:ACKNOWLEDGEMENT FROM DFO FOR PAYMENT FOR REGAIONAL WILD LIFE MANAGEMENT PLAN

OFFICE OF THE REGIONAL FOREST OFFICER, CUTTACK FOREST DIVISION
 CHAITANYA L. BHUNDA, CUTTACK, ODISHA

M- No. 8715 / 19/08/2019
 Dated, Cuttack on 19th November 2019

- To - The ADD, Principal Chief Conservator of Forests,
 Forest Division and Wildlife Office, P.O. ADD,
 1st-2nd FLOOR, Odisha, Bhubaneswar.
- Subj - Implementation of wildlife management plan in the mining area at proposed site.
- X-Subj - Request of cost of wildlife management plan in respect of Kalijapan Chromite Mines of M/s Balasore Alloys Ltd. in mining area at cost.
- Ref - This office memo no-4798 dt. 21.08.2019.

With reference to the above captioned subject, I am to inform you that as per demand issued with this office Memo No. 4794 dt. 21.08.2019, the User Agency has deposited an amount of Rs. 14,82,791/- (Rupees Fourteen Lakh Eighty Two Thousand Seven hundred Five eight only) being the balance cost of Regional Wildlife Management Plan Cost through KVIC in favor of Ad- hoc Body of Co-operative Allocation Fund Management and Planning Authority (CAFMA) Account No. 8884800211 with the Corporation Bank, New Delhi, IFSC No. COOP0000071 with the KVIC No. 8004800146721860397 dt. 21.08.2019. The copy of KVIC receipt for the above deposited amount is enclosed herewith for record of your information and necessary action. Yours faithfully,


 Regional Forest Officer
 Cuttack Forest Division

Memo No. 8715 / 19/08/2019

Copy forwarded to the Regional Chief Conservator of Forests, Angul for record of your information with reference to this office Memo No. 4798 dt. 21.08.2019.


 Regional Forest Officer
 Cuttack Forest Division

Memo No. 8715 / 19/08/2019

Copy forwarded to the User Principal Officer Kalijapan Chromite Mines of M/s Balasore Alloys Ltd. at P.O. Kalijapan, Bhubaneswar for information with reference to this office Memo No. 8884800211 dt. 21.08.2019.


 Regional Forest Officer
 Cuttack Forest Division


MINES MANAGER

**KALIAPANI CHROMITE MINES
 BALASORE ALLOYS LTD.**

ANNEXURE-VII: ENVIRONMENT STATEMENT SUBMITTED FOR THE YEAR 2014-15

BALASORE ALLOYS LIMITED



BAL/Mines/309
Dated: 05.09.2015

To

The Member Secretary,
State Pollution Control Board
Paribesh Bhawan
A/118 Nilakantha Nagar Unit-VIII
Bhubaneswar - 751012

Sub: Submission of Environmental Statement In Form-V for the financial year 2014-15.

Sir

Please find enclosed herewith the Environmental Statement in Form - V for the financial year 2014-15 with respect to our Kaliapani Chromite Mines, M/S Balasore Alloys Ltd, Kaliapani, Jajpur for your kind perusal.

Thanking you

Yours faithfully
For M/s Balasore Alloys Ltd

MINES MANAGER

Copy to: The Regional Officer, S. P. C. Board, Kalinganagar



Kaliapani Chromite Mines, Kaliapani, Jajpur, Odisha - 755 047, India, Phone No. (06726) 268206 * Fax No : (06726) 268520
E-mail : sukinda_mines@balasorealloys.com, islmines@yahoo.com * Website : www.balasorealloys.com

MINES MANAGER

**KALIAPANI CHROMITE MINES
BALASORE ALLOYS LTD.**