

o/c



BAL/Mines/MoEF& CC/138/2017-18

Date: 30.05.2017

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

Sub: Six-monthly Compliance Report of conditions of Environment Clearance Vide no No. J-11015/139/2012-IA.II (M) dated 22.08.2014 with respect to Kaliapani Chromite Mines of M/s- Balasore Alloys Ltd for the period of October, 2016- March, 2017.


Ref: Environment Clearance No. J-11015/139/2012-IA.II (M) dated 22.08.2014

Dear Sir,

We are herewith enclosed the compliancereport on the status of the conditions stipulated in the Environmental Clearance Vide No. J-11015/139/2012-IA.II (M) dated 22.08.2014 for the period of October, 2016 - March, 2017 with respect to our Kaliapani Chromite Mines, M/s Balasore Alloys Ltd (ML area 64.463 ha) for your kind perusal.

Thanking you,

Yours faithfully,  
For M/s Balasore Alloys Ltd

  
Amarnath Dhar  
Mines Manager



*Received*  
*2/6/17*



Encl: As above  
Copy to:

1. The Member Secretary, State Pollution Control Board, Paribesh Bhawan A/118 Nilakantha Nagar Unit-VIII, Bhubaneswar -751012.
2. Shri R. C Saxena (Scientist 'E' & Incharge), Central Pollution Control Board, Southend Conclave, 1582, Raidanga Main Road, Kolkata-700107.

## Report on

***“Status of Compliance to Conditions Stipulated by MoEF &CC in Environmental Clearance Order Vide No J-11015/139/2012-IA.II (M) dated 22.08.2014 in Respect of Kaliapani Chromite Mines.”***

(ML Area 64.463ha)”

***(Period October, 2016-March, 2017)***

### Submitted to:

- Ministry Of Environment, Forest and Climate Changes  
Regional Office (EZ) A/3 ,Chadraseskharapur, Bhubaneswar, Odisha.
- The Member Secretary, State Pollution Control Board,Paribesh Bhawan A/118 Nilakantha Nagar Unit-VIII,Bhubaneswar -751012.
- Shri R. C Saxena(Scientist'E' & Incharge) ,Central Pollution Control Board, Southemd Conclave,1582,Raidanga Main Road, Kolkata-700107.

### Submitted By:

**Kaliapani Chromite Mines**

**M/s Balasore Alloys Ltd**

At/Po: Kaliapani,Dist Jajpur,Odisha



**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 31.3.2017**

**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 quantity of ground water drawl 3293 m<sup>3</sup>/Day (3188 m<sup>3</sup>/Day from Mine Dewater & 105 m<sup>3</sup>/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-** Underground mining has not been started yet ,however Ventilation fan shall be provided within underground mine in order to control the air pollution during same.

Necessary PPEs viz helmet, Dust mask etc is being/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. **Photos of training & awareness programmes given below.**



- 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.

**Photos of same given below.**





**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 at six different locations including mines are being done on monthly basis and report submitted to State Pollution Control Board. The analysis report of the same is given in **Table-1**.

**[Table-1: Drinking Water Analysis Report for Cr+6]**

Sl. No	Station Details	Co-ordinates	Conc. Of Hexavalent Chromium (Cr <sup>+6</sup> ) in mg/l					
			( CPCB Standard 0.05 mg/l)					
			Oct,16	Nov,16	Dec,16	Jan,17	Feb,17	March,17
1.	TISCO Camp (GW1)	21° 01' 44.8" N 85° 44' 44.6" E	0.022	0.016	0.022	0.030	0.024	0.016
2.	Kaliapani Village (GW2)	21° 02' 39.1" N 85° 46' 21.4" E	0.008	0.010	0.014	0.012	0.018	0.012
3.	Sukurangi Village (GW3)	21° 02' 18.1" N 85° 47' 41.7" E	0.016	0.024	0.016	0.024	0.032	0.026
4.	Inside Mine (GW4)	21° 02' 07.7" N 85° 45' 32.6" E	0.006	0.008	0.010	0.016	0.010	0.014
5.	Chingudiapal (GW5)	21° 02' 56.9" N 85° 45' 04.5" E	0.020	0.014	0.008	0.010	0.016	0.028
6.	Kalarangi Village (GW6)	21° 00' 47.6" N 85° 43' 38.1" E	0.018	0.026	0.022	0.028	0.022	0.018

**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.

**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 .

The photos of Present ETP given below



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 for last rainy season given in **Table-2**.

The photo of the same given below

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

SURFACE RUN OFF ANALYSIS REPORT (July 2016 – September 2016)									
Period				July-16		Aug-2016		Sept-2016	
SL No	Parameter	Unit	Prescribed standard	SRF-1	SRF-2	SRF-1	SRF-2	SRF-1	SRF-2
1	Ph	.....	5.5-9.0	7.56	7.21	7.72	7.21	7.64	7.35
2	TSS	mg/L	100	<b>78</b>	84	91	96	82	87
3	Cr <sup>+6</sup>	mg/L	0.1	0.056	0.068	0.062	0.074	0.054	0.062



**Photo 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**



**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. 15398/ IND-I-CON-2576 dated 20.10.2016 valid upto 31.3.2018. 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 and compliance being submitted to State Pollution Control Board, Odisha.

**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.**

**[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
<b>Mines main Gate</b>	Total Nos	1507	566	560	1019	341	306	2506	944	541
	Avg Traffic Load/Hr	62.79	23.58	23.33	42.45	14.2	12.75	104.41	39.33	22.54
	Passenger Car Unit(PCU) Factor	0.75	2	3.7	0.75	2	3.7	0.75	2	3.7
	PCU/Hr	47.09	47.16	86.33	31.84	28.41	47.17	78.31	78.66	83.40
<b>Kalarngiatta</b>	Total Nos	878	379	455	950	418	265	2363	934	345
	Avg Traffic Load/Hr	36.58	15.79	18.95	39.58	17.41	11.04	98.45	38.91	14.37
	Passenger Car Unit(PCU) Factor	0.75	2	3.7	0.75	2	3.7	0.75	2	3.7
	PCU/Hr	27.43	31.58	70.14	29.68	34.83	40.85	73.84	77.83	53.18
<b>Kansa</b>	Total Nos	878	379	455	745	278	193	1374	328	309
	Avg Traffic Load/Hr	36.58	15.79	18.95	31.04	11.58	8.04	57.25	13.66	12.87



	r										
	Passenger Car Unit (PCU) Factor	0.75	2	3.7	0.75	2	3.7	0.75	2	3.7	
	PCU/Hr	27.43	31.58	70.14	23.28	23.16	29.75	42.93	27.33	47.63	

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- The ambient air quality 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 .

**Table-4: Ambient Air Quality Analysis Result at Six Different Locations**

Sampling Station: Office Area (210 02'04.7"N, 850 45' 31.0"E) , Station Code AAQ - 1													
Month	Value	Analysis Results											
		PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO µg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub> µg/m <sup>3</sup>	C <sub>6</sub> H <sub>6</sub> µg/m <sup>3</sup>	Bap ng/m <sup>3</sup>	Pb µg/m <sup>3</sup>	Ni ng/m <sup>3</sup>	As ng/m <sup>3</sup>
Oct,16	Average	57.33	26	6.68	12.2	0.23	BDL	BDL	0.60	BDL	0.0002389	BDL	BDL
	Min	48	18	5.4	10.3	0.2	BDL	BDL	0.45	BDL	0.0002	BDL	BDL
	Max	68	32	8.8	14.3	0.4	BDL	BDL	0.73	BDL	0.00028	BDL	BDL
Nov,16	Average	64.36	26.18	6.22	12.27	0.3	BDL	BDL	0.53	BDL	0.0002311	BDL	BDL
	Min	48	18	5.2	10.3	0.2	BDL	BDL	0.41	BDL	0.00018	BDL	BDL
	Max	72	32	8.8	14.3	0.4	BDL	BDL	0.66	BDL	0.00028	BDL	BDL
Dec,16	Average	61.33	26.11	6.65	13.86	BDL	BDL	BDL	0.58	BDL	0.00022	BDL	BDL
	Min	54	20	5.3	11.1	BDL	BDL	BDL	0.5	BDL	0.00014	BDL	BDL
	Max	69	31	7.9	16.8	BDL	BDL	BDL	0.69	BDL	0.00028	BDL	BDL
Jan,17	Average	61.375	25.625	7.025	14.725	BDL	BDL	BDL	0.56	BDL	0.0002313	BDL	BDL
	Min	53	20	5.4	12.7	BDL	BDL	BDL	0.45	BDL	0.00017	BDL	BDL
	Max	72	32	8.5	17.4	BDL	BDL	BDL	0.72	BDL	0.00029	BDL	BDL
Feb,17	Average	66.625	26.375	5.7125	12.825	BDL	BDL	BDL	0.52	BDL	0.0002188	BDL	BDL
	Min	58	19	4.6	10.7	BDL	BDL	BDL	0.44	BDL	0.00015	BDL	BDL
	Max	78	32	7.4	15.2	BDL	BDL	BDL	0.65	BDL	0.00029	BDL	BDL
CPCB Standards	Annual Average	60	40	50	40	2	100	100	5	1	0.5	20	6
	24 Hrs	100	60	80	80	4	180	400	5	1	1	20	6

**Sampling Station: Bachelor Barrack (21<sup>0</sup> 02'05.7"N, 85<sup>0</sup> 45' 34.2"E) Station Code : AAQ - 2**

Month	Value	Analysis Results											
		PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO µg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub> µg/m <sup>3</sup>	C <sub>6</sub> H <sub>6</sub> µg/m <sup>3</sup>	Bap ng/m <sup>3</sup>	Pb µg/m <sup>3</sup>	Ni ng/m <sup>3</sup>	As ng/m <sup>3</sup>

Oct,16	Average	60	27.88	6.46	13.35	0.37	5.68	BDL	0.68	BDL	0.000232	B DL	BDL
	Min	42	20	5.2	10	0.2	4.2	BDL	0.54	BDL	0.00018	B DL	BDL
	Max	73	34	8.2	15.4	0.6	7.8	BDL	0.78	BDL	0.00029	B DL	BDL
Nov,16	Average	72.11	28.88	5.88	12.95	0.41	5.27	BDL	0.59	BDL	0.000221	B DL	BDL
	Min	63	23	5	10.8	0.2	4.1	BDL	0.49	BDL	0.00013	B DL	BDL
	Max	79	34	7.2	15.8	0.6	6.7	BDL	0.73	BDL	0.00029	B DL	BDL
Dec,16	Average	70.33	31.55	6.26	13.3222	0.37	5.28	BDL	0.55	BDL	0.000209	B DL	BDL
	Min	60	25	5.3	11.6	0.2	4.1	BDL	0.43	BDL	0.00014	B DL	BDL
	Max	87	43	7.4	16.2	0.6	6.4	BDL	0.67	BDL	0.00029	B DL	BDL
Jan,17	Average	71.62	32.12	6.33	13.47	0.46	5.38	BDL	0.52	BDL	0.000226	B DL	BDL
	Min	61	25	5.3	11.6	0.2	4.8	BDL	0.41	BDL	0.00016	B DL	BDL
	Max	87	43	7.4	16.2	0.8	6.2	BDL	0.63	BDL	0.00028	B DL	BDL
Feb,17	Average	80.12	33	7.43	14.27	0.53	5.6	BDL	0.54	BDL	0.00022	B DL	BDL
	Min	71	27	6.1	13.4	0.2	4.4	BDL	0.45	BDL	0.00017	B DL	BDL
	Max	92	39	8.4	15.1	0.8	6.8	BDL	0.65	BDL	0.00029	B DL	BDL
CPCB Standards	Annual Average	60	40	50	40	2	100	100	5	1	0.5	20	6
	24 Hrs	100	60	80	80	4	180	400	5	1	1	20	6

**Sampling Station: Quarry (21° 01'57.8"N, 85° 46' 01.2"E), Station Code : AAQ - 3**

Month	Value	Analysis Results											
		PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO µg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub> µg/m <sup>3</sup>	C <sub>6</sub> H <sub>6</sub> µg/m <sup>3</sup>	Bap ng/m <sup>3</sup>	Pb µg/m <sup>3</sup>	Ni ng/m <sup>3</sup>	As ng/m <sup>3</sup>
		Oct,16	Average	65.44	32.33	6.72	14.6	0.36	5.68	BDL	0.67	BDL	0.000231
Oct,16	Min	54	25	5.2	11.5	0.2	4	BDL	0.58	BDL	0.0002	BDL	BDL
	Max	78	41	8.2	17.2	0.8	6.9	BDL	0.81	BDL	0.00029	BDL	BDL
	Nov,16	Average	65	24.77	5.92	13.04	0.28	5.74	BDL	0.58	BDL	0.00023	BDL
Nov,16	Min	52	19	4.9	11.2	0.2	5.1	BDL	0.46	BDL	0.00016	BDL	BDL
	Max	76	31	7.2	15.7	0.4	6.5	BDL	0.78	BDL	0.00029	BDL	BDL
	Dec,16	Average	73.22	30.11	6.67	13.85	0.5	5.57	BDL	0.58	BDL	0.000224	BDL
Dec,16	Min	68	27	4.9	11.5	0.2	4.7	BDL	0.45	BDL	0.00017	BDL	BDL
	Max	82	35	7.8	16	0.8	6.9	BDL	0.73	BDL	0.00028	BDL	BDL
	Jan,17	Average	68	27.75	6.22	13.07	0.44	5.38	BDL	0.58	BDL	0.000221	BDL
Jan,17	Min	58	22	5.4	10.8	0.2	4.4	BDL	0.47	BDL	0.00015	BDL	BDL

	Max	81	36	7.2	15.8	0.8	6.7	BDL	0.74	BDL	0.00029	BDL	BDL
	Average	79	36	7.16	13.23	0.3	5.41	BDL	0.53	BDL	0.000235	BDL	BDL
	Min	64	30	6.4	11.7	0.2	4.6	BDL	0.44	BDL	0.00016	BDL	BDL
Feb,17	Max	64	30	6.4	11.7	0.2	4.6	BDL	0.44	BDL	0.00016	BDL	BDL
CPCB Standards	Annual Average	60	40	50	40	2	100	100	5	1	0.5	20	6
	24 Hrs	100	60	80	80	4	180	400	5	1	1	20	6

**Sampling Station: Kaliapani Village (21<sup>0</sup> 03'42.0"N, 85<sup>0</sup> 46' 19.3"E), Station Code : AAQ - 4**

Month	Value	Analysis Results											
		PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub>	NO <sub>2</sub>	CO µg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub>	C <sub>6</sub> H <sub>6</sub> µg/m <sup>3</sup>	Bap ng/m <sup>3</sup>	Pb µg/m <sup>3</sup>	Ni ng/m <sup>3</sup>	As ng/m <sup>3</sup>
				µg/m <sup>3</sup>	µg/m <sup>3</sup>			µg/m <sup>3</sup>					
Oct,16	Average	57.33	26	6.68	12.2	0.23	BDL	BDL	0.60	BDL	0.000239	BDL	BDL
	Min	48	18	5.4	10.3	0.2	BDL	BDL	0.45	BDL	0.0002	BDL	BDL
	Max	68	32	8.8	14.3	0.4	BDL	BDL	0.73	BDL	0.00028	BDL	BDL
Nov,16	Average	65.77	26.44	6.03	12.26	0.3	BDL	BDL	0.53	BDL	0.000231	BDL	BDL
	Min	55	21	5.2	10.6	0.2	BDL	BDL	0.41	BDL	0.00018	BDL	BDL
	Max	72	32	7.8	14.3	0.4	BDL	BDL	0.66	BDL	0.00028	BDL	BDL
Dec,16	Average	61.33	26.11	6.65	13.86	BDL	BDL	BDL	0.58	BDL	0.00022	BDL	BDL
	Min	54	20	5.3	11.1	BDL	BDL	BDL	0.5	BDL	0.00014	BDL	BDL
	Max	69	31	7.9	16.8	BDL	BDL	BDL	0.69	BDL	0.00028	BDL	BDL
Jan,17	Average	61.37	25.62	7.02	14.72	BDL	BDL	BDL	0.56	BDL	0.000231	BDL	BDL
	Min	53	20	5.4	12.7	BDL	BDL	BDL	0.45	BDL	0.00017	BDL	BDL
	Max	72	32	8.5	17.4	BDL	BDL	BDL	0.72	BDL	0.00029	BDL	BDL
Feb,17	Average	66.62	26.37	5.7125	12.82	BDL	BDL	BDL	0.52	BDL	0.0002188	BDL	BDL
	Min	58	19	4.6	10.7	BDL	BDL	BDL	0.44	BDL	0.00015	BDL	BDL
	Max	78	32	7.4	15.2	BDL	BDL	BDL	0.65	BDL	0.00029	BDL	BDL
CPCB Standard <sup>s</sup>	Annual Average	60	40	50	40	2	100	100	5	1	0.5	20	6
	24 Hrs	100	60	80	80	4	180	400	5	1	1	20	6

**Sampling Station: Ransol Village (21<sup>0</sup> 03'43.1"N, 85<sup>0</sup> 44' 32.2"E) Station Code : AAQ – 5**

Month	Value	Analysis Results											
		PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub>	NO <sub>2</sub>	CO µg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub>	C <sub>6</sub> H <sub>6</sub> µg/m <sup>3</sup>	Bap ng/m <sup>3</sup>	Pb µg/m <sup>3</sup>	Ni ng/m <sup>3</sup>	As ng/m <sup>3</sup>
				µg/m <sup>3</sup>	µg/m <sup>3</sup>			µg/m <sup>3</sup>					
Oct,16	Average	48.11	19.22	4.84	10.94	0.2	5.95	BDL	0.58	BDL	0.000211	BDL	BDL
	Min	35	15	4.1	9.6	0.2	5	BDL	0.47	BDL	0.00014	BDL	BDL
	Max	64	24	6.4	12.8	0.2	6.8	BDL	0.69	BDL	0.00029	BDL	BDL
Nov,16	Average	60	24.44	5.6	11.77	BDL	5.57	BDL	0.48	BDL	0.000212	BDL	BDL
	Min	48	18	4.6	10.4	BDL	4.7	BDL	0.4	BDL	0.00015	BDL	BDL
	Max	69	29	6.8	13.4	BDL	6.4	BDL	0.6	BDL	0.00029	BDL	BDL
Dec,16	Average	60.33	28	5.56	12.31	BDL	5.34	BDL	0.54	BDL	0.000212	BDL	BDL
	Min	51	20	4.4	10.4	BDL	4	BDL	0.42	BDL	0.00015	BDL	BDL
	Max	78	40	7.6	17.8	BDL	6.9	BDL	0.65	BDL	0.00028	BDL	BDL
Jan,17	Average	56.25	28.37	5.36	13.08	BDL	5.8	BDL	0.52	BDL	0.000215	BDL	BDL



	Min	47	23	4.7	12.4	BDL	4.7	BDL	0.45	BDL	0.00014	BDL	BDL
	Max	61	33	6.3	14.2	BDL	6.5	BDL	0.63	BDL	0.00027	BDL	BDL
	<b>Average</b>	60.87	26.62	5.57	12.85	0.2	5.3375	BDL	0.49	BDL	0.000225	BDL	BDL
Feb,17	Min	50	20	4.3	10.6	0.2	4.1	BDL	0.4	BDL	0.00016	BDL	BDL
	Max	74	33	7.3	18.4	0.2	6.8	BDL	0.64	BDL	0.00028	BDL	BDL
<b>CPCB Standards</b>	Annual Average	60	40	50	40	2	100	100	5	1	0.5	20	6
	<b>24 Hrs</b>	100	60	80	80	4	180	400	5	1	1	20	6

**Sampling Station: Sukrangi Village (21<sup>0</sup> 02'44.5"N, 85<sup>0</sup> 48' 16.3"E) Station Code : AAQ - 6**

Month	Value	Analysis Results											
		PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub>	NO <sub>2</sub>	CO µg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub>	C <sub>6</sub> H <sub>6</sub> µg/m <sup>3</sup>	Bap ng/m <sup>3</sup>	Pb µg/m <sup>3</sup>	Ni ng/m <sup>3</sup>	As ng/m <sup>3</sup>
				µg/m <sup>3</sup>	µg/m <sup>3</sup>			µg/m <sup>3</sup>					
<b>Oct,16</b>	<b>Average</b>	47.44	22.22	<b>6.14</b>	11.96	0.32	5.21	BDL	0.79	BDL	0.000247	BDL	BDL
	Min	32	15	4.8	9.2	0.2	4	BDL	0.7	BDL	0.0002	BDL	BDL
	Max	59	30	8.1	15.3	0.6	6	BDL	0.89	BDL	0.0003	BDL	BDL
<b>Nov,16</b>	<b>Average</b>	60.55	24.66667	<b>5.83</b>	11.82	BDL	5.1	BDL	0.63	BDL	0.000236	BDL	BDL
	Min	55	20	5	10.3	BDL	4.4	BDL	0.52	BDL	0.00016	BDL	BDL
	Max	67	29	7.1	13.8	BDL	5.9	BDL	0.78	BDL	0.00034	BDL	BDL
<b>Dec,16</b>	<b>Average</b>	58.11	25.66667	<b>5.61</b>	12.32	BDL	5.37	BDL	0.55	BDL	0.00025	BDL	BDL
	Min	46	19	4.8	10.5	BDL	4.7	BDL	0.45	BDL	0.00019	BDL	BDL
	Max	72	34	7.2	13.8	BDL	6.7	BDL	0.65	BDL	0.00032	BDL	BDL
<b>Jan,17</b>	<b>Average</b>	60.12	26	6.32	14.23	BDL	5.28	BDL	0.57	BDL	0.000233	BDL	BDL
	Min	50	17	4.8	10.7	BDL	4.8	BDL	0.47	BDL	0.00017	BDL	BDL
	Max	73	35	8.7	17.1	BDL	6.3	BDL	0.67	BDL	0.00029	BDL	BDL
Feb,17	<b>Average</b>	67.37	28.125	6.18	12.42	BDL	5.07	BDL	0.51	BDL	0.0002213	BDL	BDL
	Min	58	20	4.9	10.6	BDL	4.1	BDL	0.42	BDL	0.00016	BDL	BDL
	Max	77	35	7.2	14.3	BDL	6.4	BDL	0.61	BDL	0.00028	BDL	BDL
<b>CPCB Standards</b>	Annual Average	60	40	50	40	2	100	100	5	1	0.5	20	6
	<b>24 Hrs</b>	100	60	80	80	4	180	400	5	1	1	20	6

**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- There is no crusher and screening Plant running at mines.** 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, fixed sprinkler & water tankers given below as Photo-6.

## COB PLANT



## FIXED SPRINKLER



## 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.

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 October 2016 to March,2017 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.

#### **EXISTING ROOFTOP RAIN WATER HARVESTING STRUCTURE**



#### **ONGOING 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.





29	Phosphorus (as P)	mg/l	\$	0.62	0.50	0.64	0.46	0.42	0.68
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Note- AL- Agreeable, CL-Colourless, ND-Not Detecte,.. \$-Not Specified.

### For Period Feb,2017

Sl. No.	Parameters	Unit	Standard as per IS-10500	GW1	GW2	GW3	GW4	GW5	GW6
				Open Well	Open Well	Open Well	Bore Well	Open Well	Open Well
1	pH	---	6.5-8.5	7.57	7.94	7.62	7.29	7.04	7.46
2	Odour	---	Agreeable	AL	AL	AL	AL	AL	AL
3	Colour	Hazen	5 (Max)	CL	CL	CL	CL	CL	CL
4	Taste	---	Agreeable	AL	AL	AL	AL	AL	AL
5	Turbidity	NTU	1 (Max)	0.2	0.6	0.4	0.8	0.2	0.8
6	Chloride (as Cl)	mg/l	250 (Max)	13.1	15.7	11.9	12.3	9.8	11.4
7	Residual free Chlorine	mg/l	0.2 (Min)	ND	ND	ND	ND	ND	ND
8	Total Dissolved Solid	mg/l	500 (Max)	105	113	121	129	136	108
9	Total Hardness (as CaCO <sub>3</sub> )	mg/l	200 (Max)	32	35	46	36	48	41
10	Iron (as Fe)	mg/l	0.3 (Max)	0.14	0.19	0.21	0.26	0.24	0.27
11	Calcium (as Ca)	mg/l	75 (Max)	18.3	11.5	14.7	12.8	10.6	13.6
12	Magnesium (as Mg)	mg/l	30 (Max)	8.7	9.8	7.6	8.5	9.6	7.4
13	Sulfate (as SO <sub>4</sub> )	mg/l	200 (Max)	16.2	15.7	10.1	13.4	11.9	15.3
14	Manganese (as Mn)	mg/l	0.10 (Max)	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
15	Nitrate (as NO <sub>3</sub> )	mg/l	45 (Max)	0.47	0.54	0.31	0.49	0.63	0.48
16	Alkalinity (as CaCO <sub>3</sub> )	mg/l	200 (Max)	28	36	22	37	24	18
17	Chromium (as Cr <sup>+6</sup> )	mg/l	\$	0.024	0.018	0.032	0.010	0.016	0.022
18	Fluoride (as F)	mg/l	1.0(Max)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
19	Cadmium (as Cd)	mg/l	0.003 (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)	0.16	0.12	0.20	0.25	0.14	0.29
22	Lead (as Pb)	mg/l	0.01 (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	0.5 (Max)	ND	ND	BDL	BDL	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 (as B)	mg/l	0.5 (Max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
28	Arsenic (as As)	mg/l	0.01(Max)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
29	Phosphorus (as P)	mg/l	\$	0.48	0.54	0.49	0.58	0.40	0.62

Note- AL- Agreeable, CL-Colourless, ND-Not Detecte,.. \$-Not Specified.

#### Details of Monitoring Station

- GW1- Tisco Camp (21<sup>0</sup> 01'44.8"N, 85<sup>0</sup>44'44.6"E)
- GW2- Kaliapani Village (21<sup>0</sup> 02'39.1"N, 85<sup>0</sup>46'21.4"E)
- GW3- Sukurangi (21<sup>0</sup> 02' 18.1"N, 85<sup>0</sup>47' 41.7"E)
- GW4- Inside Mine (21<sup>0</sup>02'7.7"N, 85<sup>0</sup>45'32.6"E)
- GW5- Chingudiapal (21<sup>0</sup> 02'56.9"N, 85<sup>0</sup> 45' 4.5"E)
- GW6- Kalarangi Village (21<sup>0</sup> 0' 47.6"N, 85<sup>0</sup> 43' 38.1"E)

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 (Oct, 2016) and Pre-Monsoon (March'2017) season is given in the **Table-07**

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

<b>Flow rate of up-stream &amp; down-stream at Damsala Nallah</b>					
<b>Kaliapani Chromite Mines of M/s Balasore Alloys Limited</b>					
SI No	Location	Co-ordinate of the location	Month of Monitoring	Flow rate m <sup>3</sup> /s	Flow rate IN CUSEC
1	Damsala U/S	21 <sup>0</sup> 02'35.9"N 85 <sup>0</sup> 45'27.01"E	Nov 2016	4.80	169.38
2	Damsala D/S	21 <sup>0</sup> 02'10.47"N 85 <sup>0</sup> 44'31.92"E		5.09	179.69
3	Damsala U/S	21 <sup>0</sup> 02'35.9"N 85 <sup>0</sup> 45'27.01"E	Jan 2017	4.27	150.93
4	Damsala D/S	21 <sup>0</sup> 02'10.47"N 85 <sup>0</sup> 44'31.92"E		4.48	158.24

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 16550 Sqm area covered with grass turffing & 78540 nos of saplings planted at dump slope, roadside in side ML area since 2010-11. The details of the same is given in **Table-8,9 &10**.

**Photo of Plantation,coirmatting & Grass turffing given below**

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**

<b>DETAILS OF COIRMATTING</b>		
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
<b>Total</b>		<b>37100</b>

**Table-9: Details of Grass Turffing**

<b>DETAILS OF GRASS TURFING</b>		
<b>YEAR</b>	<b>LOCATION</b>	<b>AREA (SQM)</b>
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	6350
<b>Total</b>		<b>16550</b>

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

<b>DETAILS OF INSIDE ML AREA PLANTATION</b>					
<b>M/s BALASORE ALLOYS LIMITED</b>					
<b>KALIAPANI CHROMITE MINES</b>					
<b>YEAR</b>	<b>LOCATION</b>	<b>AREA (Ha.)</b>	<b>NOS.</b>	<b>SURVIVAL %</b>	<b>SPECIES</b>
2010-11	Dump-1	2	11020	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	87%	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	87%	
2012-13	Dump-3	0.2	250		C siamea, Pongamia, Albizzia, Bamboo, Sisoo, Teak, Jamun, Casuarina, Golmohur, Peltophorum, Alstonia,

	Dum-1	1.8	8150		Neem, Gmelina, Acacia, Mimosups, Mango, Jackfruit, Guava, Citrus, Pomegranate, Sapota, Cashew and A mangium
2013-14	Dump-3, slope	0.8	6882	85%	Peltophorum, Acacia, Albizzia, Pongamia, Tamarind, Almond, Neem and Arjun
	Safety zone, Dump-3	0.5	3018	85%	
	Dump-1 (Access road)	0.7	2085	87%	
2014-15	Dump-1 (Access road) slope and safety zone	1	2565	86%	Peltophorum, Acacia, A mangium, C siamia, Albizzia, Mango, Custard apple, Guava
	Dump-1 (North)	1.25	4000	86%	Peltophorum, Acacia, Albizzia, Bouganvillea, Simarouba, Gliricidia and Arjun
	Dump-2 slope and safety zone	4	12000	88%	Peltophorum, Acacia, Albizzia, Bouganvillea, Simarouba, Gliricidia, A mangium, Eucalyptus, Bamboo, Subbabul and Arjun
2015-16	Admin. Office premises & Access road Jindal side from Old washing platform to View point (Dump-1)	1.25	5000	85%	Peltophorum, Acacia, Albizzia, Bouganvillea, Simarouba, Gliricidia and Arjun
	Common boundary with IMFA Area ( Mines Pit )	1	4000	89%	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	86%	Peltophorum, Acacia, Albizzia, Bouganvillea, Simarouba, Gliricidia and Arjun
	Over coirmatting of dump-3, 2nd terrace (mines pit side)	0.1875	750	85%	Peltophorum, Acacia, Albizzia, Bouganvillea, Simarouba, Gliricidia, A mangium, Eucalyptus, Bamboo, Subbabul and Arjun
	Dump-3(Jindal site Boundary area)	1.2	4800	86%	Peltophorum, Acacia, Albizzia, Bouganvillea, Simarouba, Gliricidia, A mangium, Eucalyptus, Bamboo, Subbabul and Arjun
	Dump-3 Slope	0.18	750	90%	Albizzia, Bouganvillea, Simarouba, Gliricidia, A mangium, Eucalyptus, Bamboo, Subbabul and Arjun
2016-17	Dump-3 slope	0.2	2000	90%	Albizzia, Bouganvillea, Simarouba, Gliricidia, A mangium, Eucalyptus, Bamboo, Subbabul and Arjun
<b>TOTAL</b>			<b>78540</b>		



## PLANTATION INSIDE ML AREA



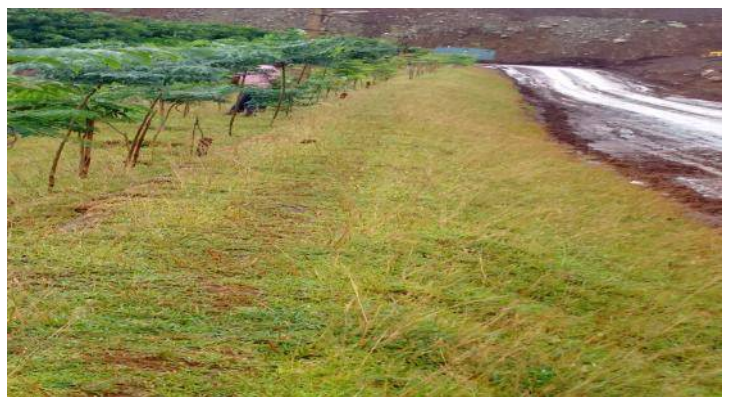
## COIR MATTING OVER DUMP SLOPE







### 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 given below

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

<b>Environmental Measures</b>	<b>Dump-1</b>	<b>Dump-2</b>	<b>Dump-3</b>
Retaining wall	360M×20M×15M	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	15750 nos



Grass Turffing	10200 Cum		
Settling Pit	Two nos 90 Cum & 192 Cum		Two nos 972 Cum & 288 Cum

### Gabion Wall at Dump-1



Retaining wall at Dump-2

Retaining wall at Dump-3



- 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 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 Oct,16 to March,2017 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(April-September,2016) given in **Table-2**.

**Table-12**  
**ETP ANALYSIS REPORT**  
**KALIAPANI CHROMITE MINES**  
**Oct,2016 to March,2017**

Date of Sampling		: 03.10.2016			
Sl.No.	Parameters	Unit	Prescribed Standards*	ETP inlet	ETP outlet
1	pH	...	5.5-9.0	7.84	6.73
2	Total Suspended Solids	mg/l	100	74	21
3	Chromium(as Cr <sup>+6</sup> )	mg/l	0.05	1.547	0.010
4	Total Chromium (as Cr)	mg/l	2.0	2.079	0.036
5	Total Iron	mg/l	3.0	0.121	1.126
6	Oil & Grease	mg/l	10	<1	<1

Date of Sampling : 24.10.2016

Sl.No.	Parameters	Unit	Prescribed Standards*	ETP inlet	ETP outlet
1	pH	...	5.5-9.0	7.54	6.84
2	Total Suspended Solids	mg/l	100	71	20
3	Chromium(as Cr <sup>+6</sup> )	mg/l	0.05	1.542	0.014
4	Total Chromium (as Cr)	mg/l	2.0	0.430	0.042
5	Total Iron	mg/l	3.0	0.074	1.204
6	Oil & Grease	mg/l	10	<1	<1

Date of Sampling : 07.11.2016

Sl.No.	Parameters	Unit	Prescribed Standards*	ETP inlet	ETP outlet
1	pH	...	5.5-9.0	7.91	6.80
2	Total Suspended Solids	mg/l	100	68	24
3	Chromium(as Cr <sup>+6</sup> )	mg/l	0.05	1.475	0.012
4	Total Chromium (as Cr)	mg/l	2.0	2.037	0.044
5	Total Iron	mg/l	3.0	0.109	1.143
6	Oil & Grease	mg/l	10	<1	<1

Date of Sampling : 21.11.2016

Sl.No.	Parameters	Unit	Prescribed Standards*	ETP inlet	ETP outlet
1	pH	...	5.5-9.0	7.83	6.96
2	Total Suspended Solids	mg/l	100	64	20
3	Chromium(as Cr <sup>+6</sup> )	mg/l	0.05	1.381	0.010
4	Total Chromium (as Cr)	mg/l	2.0	0.406	0.038
5	Total Iron	mg/l	3.0	0.070	1.184
6	Oil & Grease	mg/l	10	<1	<1

Date of Sampling : 05.12.2016

Sl.No.	Parameters	Unit	Prescribed Standards*	ETP inlet	ETP outlet
1	pH	...	5.5-9.0	8.24	7.36
2	Total Suspended Solids	mg/l	100	60	21
3	Chromium(as Cr <sup>+6</sup> )	mg/l	0.05	1.396	0.010
4	Total Chromium (as Cr)	mg/l	2.0	2.182	0.032
5	Total Iron	mg/l	3.0	0.105	1.167
6	Oil & Grease	mg/l	10	<1	<1

Date of Sampling : 19.12.2016

Sl.No.	Parameters	Unit	Prescribed Standards*	ETP inlet	ETP outlet
1	pH	...	5.5-9.0	7.91	6.77
2	Total Suspended Solids	mg/l	100	57	18
3	Chromium(as Cr <sup>+6</sup> )	mg/l	0.05	1.352	0.008
4	Total Chromium (as Cr)	mg/l	2.0	0.375	0.026
5	Total Iron	mg/l	3.0	0.064	1.146
6	Oil & Grease	mg/l	10	<1	<1

Date of Sampling : 09.01.2017

Sl.No.	Parameters	Unit	Prescribed Standards*	ETP inlet	ETP outlet
1	pH	...	5.5-9.0	8.37	7.51
2	Total Suspended Solids	mg/l	100	56	20
3	Chromium(as Cr <sup>+6</sup> )	mg/l	0.05	1.324	0.008
4	Total Chromium (as Cr)	mg/l	2.0	2.093	0.026
5	Total Iron	mg/l	3.0	0.127	1.132
6	Oil & Grease	mg/l	10	<1	<1

Date of Sampling : 23.01.2017

Sl.No.	Parameters	Unit	Prescribed Standards*	ETP inlet	ETP outlet
1	pH	...	5.5-9.0	7.64	6.93
2	Total Suspended Solids	mg/l	100	52	16
3	Chromium(as Cr <sup>+6</sup> )	mg/l	0.05	1.287	0.012
4	Total Chromium (as Cr)	mg/l	2.0	0.331	0.030
5	Total Iron	mg/l	3.0	0.061	1.155
6	Oil & Grease	mg/l	10	<1	<1
Date of Sampling : 06.02.2017					

Sl.No.	Parameters	Unit	Prescribed Standards*	ETP inlet	ETP outlet
1	pH	...	5.5-9.0	8.73	7.34
2	Total Suspended Solids	mg/l	100	51	18
3	Chromium(as Cr <sup>+6</sup> )	mg/l	0.05	1.276	0.006
4	Total Chromium (as Cr)	mg/l	2.0	2.039	0.020
5	Total Iron	mg/l	3.0	0.108	1.177
6	Oil & Grease	mg/l	10	<1	<1
Date of Sampling : 20.02.2017					



Sl.No.	Parameters	Unit	Prescribed Standards*	ETP inlet	ETP outlet
1	pH	...	5.5-9.0	8.17	7.22
2	Total Suspended Solids	mg/l	100	49	15
3	Chromium(as Cr <sup>+6</sup> )	mg/l	0.05	1.210	0.008
4	Total Chromium (as Cr)	mg/l	2.0	0.286	0.024
5	Total Iron	mg/l	3.0	0.058	1.203
6	Oil & Grease	mg/l	10	<1	<1

Date of Sampling : 06.03.2017

Sl.No.	Parameters	Unit	Prescribed Standards*	ETP inlet	ETP outlet
1	pH	...	5.5-9.0	8.84	7.51
2	Total Suspended Solids	mg/l	100	48	16
3	Chromium(as Cr <sup>+6</sup> )	mg/l	0.05	1.192	0.004
4	Total Chromium (as Cr)	mg/l	2.0	2.005	0.016
5	Total Iron	mg/l	3.0	0.097	1.143
6	Oil & Grease	mg/l	10	<1	<1

Date of Sampling : 27.03.2017

Sl.No.	Parameters	Unit	Prescribed Standards*	ETP inlet	ETP outlet
1	pH	...	5.5-9.0	8.73	7.40
2	Total Suspended Solids	mg/l	100	45	14
3	Chromium(as Cr <sup>+6</sup> )	mg/l	0.05	1.176	0.006
4	Total Chromium (as Cr)	mg/l	2.0	0.224	0.020
5	Total Iron	mg/l	3.0	0.067	1.185
6	Oil & Grease	mg/l	10	<1	<1

(\* General Standard For discharge of Environmental pollutants Part:-A: Effluents-Schedule VI of Environment (Protection) Rule,1986.

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.

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,2016) and Pre-Monsoon (Jan,2017) season is given in the **Table-7**.

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]**

<b>Date of Sampling : 21.11.2016</b>						
<b>Sl. No.</b>	<b>Parameters</b>	<b>Unit</b>	<b>Standard as per IS-2296 Class-C</b>	<b>SW1</b>	<b>SW2</b>	<b>SW3</b>
1	Colour,	Hazen	Colourless	Colourless	Colourless	Colourless
2	pH value	----	5.5-9.0	7.67	7.28	7.51
3	Iron (as Fe)	mg/l	3	0.46	0.51	0.43
4	Chloride (as Cl)	mg/l	\$	17.4	12.8	14.3
5	Fluoride (as F)	mg/l	2.0	0.06	0.10	0.12
6	Total Dissolved Solids	mg/l	\$	72	80	84
7	Total Suspended Solids	mg/l	100	52	56	63
8	Manganese (as Mn)	mg/l	2	0.048	0.032	0.027
9	Sulfate (as SO <sub>4</sub> )	mg/l	\$	17.8	14.3	11.4
10	Nitrate (as NO <sub>3</sub> )	mg/l	1.0	0.45	0.30	0.36
11	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	1.0	<0.001	<0.001	<0.001
12	Mercury (as Hg)	mg/l	0.01	<0.00001	<0.00001	<0.00001
13	Cadmium (as Cd)	mg/l	2.0	<0.00001	<0.00001	<0.00001
14	Chromium(as Cr <sup>+6</sup> )	mg/l	0.1	0.024	0.020	0.034
15	Total Chromium (ac Cr)	mg/l	2.0	0.042	0.038	0.056
16	Selenium (as Se)	mg/l	0.05	<0.0001	<0.0001	<0.0001
17	Arsenic (as As)	mg/l	0.2	<0.0001	<0.0001	<0.0001
18	Cyanide (as CN)	mg/l	0.2	<0.002	<0.002	<0.002
19	Lead (as Pb)	mg/l	0.1	<0.0001	<0.0001	<0.0001
20	Zinc (as Zn)	mg/l	5.0	<0.0001	<0.0001	<0.0001
21	Nickel (as Ni)	mg/l	3.0	0.34	0.31	0.24
22	Oil Grease	mg/l	10	ND	ND	ND
23	Free Ammonia (NH <sub>3</sub> )	mg/l	5.0	0.11	0.14	0.10
24	Coliform Organism	MPN/100ml	\$	135	126	142
25	Bio-assay Test	----	90% of survival of fish after 96 hours in 100% effluent	98%	98%	98%
26	Dissolved Oxygen as O <sub>2</sub>	mg/l	\$	6.8	5.9	6.2
27	BOD, 3 days at 27 <sup>0</sup> C	mg/l	30	2.5	2.9	2.0
28	COD	mg/l	250	5.1	6.3	5.4
29	Electrical Conductivity (EC), μmhos/cm	μmhos/cm	\$	133	128	138
30	Phosphorus (as P)	mg/l	\$	0.21	0.26	0.34

<b>Date of Sampling : 20.02.2017</b>						
<b>Sl. No.</b>	<b>Parameters</b>	<b>Unit</b>	<b>Standard as per IS-2296 Class-C</b>	<b>SW1</b>	<b>SW2</b>	<b>SW3</b>
1	Colour,	Hazen	Colourless	Colourless	Colourless	Colourless
2	pH value	----	5.5-9.0	7.35	7.64	7.95
3	Iron (as Fe)	mg/l	3	0.57	0.52	0.47
4	Chloride (as Cl)	mg/l	\$	15.3	13.5	12.9
5	Fluoride (as F)	mg/l	2.0	0.08	0.14	0.11
6	Total Dissolved Solids	mg/l	\$	67	73	78
7	Total Suspended Solids	mg/l	100	50	48	61
8	Manganese (as Mn)	mg/l	2	0.051	0.039	0.032
9	Sulfate (as SO <sub>4</sub> )	mg/l	\$	18.4	15.5	13.1
10	Nitrate (as NO <sub>3</sub> )	mg/l	1.0	0.24	0.37	0.31
11	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	1.0	<0.001	<0.001	<0.001
12	Mercury (as Hg)	mg/l	0.01	<0.00001	<0.00001	<0.00001
13	Cadmium (as Cd)	mg/l	2.0	<0.00001	<0.00001	<0.00001
14	Chromium(as Cr <sup>+6</sup> )	mg/l	0.1	0.018	0.026	0.030
15	Total Chromium (ac Cr)	mg/l	2.0	0.028	0.032	0.044
16	Selenium (as Se)	mg/l	0.05	<0.0001	<0.0001	<0.0001
17	Arsenic (as As)	mg/l	0.2	<0.0001	<0.0001	<0.0001
18	Cyanide (as CN)	mg/l	0.2	<0.002	<0.002	<0.002
19	Lead (as Pb)	mg/l	0.1	<0.0001	<0.0001	<0.0001
20	Zinc (as Zn)	mg/l	5.0	<0.0001	<0.0001	<0.0001

21	Nickel (as Ni)	mg/l	3.0	0.23	0.36	0.32
22	Oil Grease	mg/l	10	ND	ND	ND
23	Free Ammonia (NH <sub>3</sub> )	mg/l	5.0	0.18	0.11	0.13
24	Coliform Organism	MPN/100ml	\$	128	119	135
25	Bio-assay Test	----	90% of survival of fish after 96 hours in 100% effluent	98%	98%	98%
26	Dissolved Oxygen as O <sub>2</sub>	mg/l	\$	7.1	6.3	5.5
27	BOD, 3 days at 27 <sup>0</sup> C	mg/l	30	2.2	2.5	2.3
28	COD	mg/l	250	5.4	5.9	6.2
29	Electrical Conductivity (EC), $\mu$ mhos/cm	$\mu$ mhos/cm	\$	120	114	137
30	Phosphorus (as P)	mg/l	\$	0.28	0.22	0.27

STATION	CODE	CO-ORDINATE	RL
DAMSALA NALLAH NEAR CHIRIGUNIA U/S	SW1	N21 <sup>0</sup> 02'39.1" E85 <sup>0</sup> 46'21.4"	102
DAMSALA NALLAH NEAR CHINGUDIAPALA D/S	SW2	N21 <sup>0</sup> 02'8.8" E85 <sup>0</sup> 44'27.8"	84
NEAR MINE BOUNDARY DISCHARGE	SW3	N21 <sup>0</sup> 02'18.1" E85 <sup>0</sup> 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. . Another rooftop rain water harvesting structure construction proposal is in progress. .

**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. Vehicular emission report given in table -14. Photographs showing vehicles covered with tarpaulin is given below.

**Table:-14: Vehicular Emission Result**

Date of Testing : 19.09.2016

**Vehicular Emission Details**

Sl. No.	Vehicle No.	Vehicle Make	Vehicle Model	CO (%)	HC (ppm)	NO <sub>x</sub> (%)	Smoke (HSU)
1	OD-04- B- 8779	MAN	HIWA	0.124	59	78.63	36.48
2	OD-04- E- 7537	MAN	HIWA	0.116	62	79.52	26.56
3	OD-04- E- 8594	MAN	HIWA	0.108	73	77.21	42.20
4	OD-04- E- 8592	MAN	HIWA	0.097	58	78.46	50.49
5	OD-04- B- 8781	MAN	HIWA	0.117	70	78.36	29.36
6	OD-04- B- 8780	MAN	HIWA	0.089	82	77.74	46.77
7	OD-04- E- 8589	MAN	HIWA	0.099	67	77.92	37.95
8	OD-04- E- 8590	MAN	HIWA	0.101	77	80.56	49.78
9	OD-04- E- 7536	MAN	HIWA	0.126	68	79.02	38.49
10	OD-04- G- 5855	MAN	HIWA	0.109	81	80.76	39.93
11	OD-04- E- 7535	MAN	HIWA	0.116	79	78.90	59.55
12	OD-04- B- 8776	MAN	HIWA	0.120	84	78.87	39.47
13	OD-04- B- 8778	MAN	HIWA	0.098	69	75.59	56.59
14	OD-04- B- 8782	MAN	HIWA	0.082	74	75.59	45.33
15	OD-04- E- 7537	MAN	HIWA	0.123	65	78.90	52.52
16	OD-04- E- 7535	MAN	HIWA	0.112	76	77.79	34.61
17	OD-04- E- 7534	MAN	HIWA	0.104	80	77.51	17.65
18	OD-04- E- 7533	MAN	HIWA	0.093	55	76.50	54.36
19	Water Tanker	--	--	0.135	87	78.22	36.39
20	Water Tanker	--	--	0.141	90	78.44	33.25
<b>CPCB Standard</b>				<b>3.0</b>	<b>1500</b>	<b>--</b>	<b>65</b>

**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. Copy STP discharge water analysis report attached as **Annexure-IV**.

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

#### **Sewage Treatment Plant**



#### **VEHICLE SERVICING CENTER WITH OIL & GREASE TRAP**



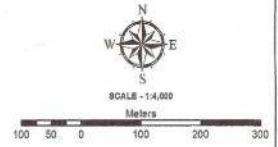
xxiv. Digital processing of the entire lease area using remote sensing technique shall be carried out regularly once in three years for monitoring land use pattern and report submitted to Ministry of Environment and Forests and its Regional Office, Bhubaneswar.

**Status-** Digital processing of the entire lease area using remote sensing technique is carried out 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
<b>TOTAL AREA</b>		<b>62.225</b>

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



SL.NO	PILLAR ID	LONGITUDE	LATITUDE	EASTING	NORTHING
1	DUMPI-1	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
2	DUMPI-2	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
3	DUMPI-3	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
4	DUMPI-4	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
5	DUMPI-5	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
6	DUMPI-6	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
7	DUMPI-7	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
8	DUMPI-8	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
9	DUMPI-9	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
10	DUMPI-10	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
11	DUMPI-11	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
12	DUMPI-12	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
13	DUMPI-13	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
14	DUMPI-14	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
15	DUMPI-15	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
16	DUMPI-16	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
17	DUMPI-17	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
18	DUMPI-18	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
19	DUMPI-19	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
20	DUMPI-20	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
21	DUMPI-21	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
22	DUMPI-22	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
23	DUMPI-23	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
24	DUMPI-24	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
25	DUMPI-25	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
26	DUMPI-26	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
27	DUMPI-27	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
28	DUMPI-28	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
29	DUMPI-29	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
30	DUMPI-30	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
31	DUMPI-31	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
32	DUMPI-32	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
33	DUMPI-33	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
34	DUMPI-34	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
35	DUMPI-35	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
36	DUMPI-36	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
37	DUMPI-37	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
38	DUMPI-38	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
39	DUMPI-39	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
40	DUMPI-40	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
41	DUMPI-41	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
42	DUMPI-42	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
43	DUMPI-43	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
44	DUMPI-44	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
45	DUMPI-45	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
46	DUMPI-46	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
47	DUMPI-47	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
48	DUMPI-48	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
49	DUMPI-49	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
50	DUMPI-50	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
51	DUMPI-51	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
52	DUMPI-52	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
53	DUMPI-53	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
54	DUMPI-54	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
55	DUMPI-55	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927
56	DUMPI-56	89°45'21.58838"	21°02'01.42746"	371280.726	2329377.927

SL.NO	LAND FEATURE	AREA IN Ha
1	MINING AREA	10.601
2	QUARRY	21.577
4	DUMP	30.047
<b>TOTAL AREA</b>		<b>62.225</b>

PILLAR ID	LONGITUDE	LATITUDE	EASTING	NORTHING
ML-A	89°45'23.21991"	21°02'05.64667"	370955.053	2329518.513
ML-B	89°45'30.48908"	21°01'50.87978"	371247.884	2329049.661
ML-C	89°45'57.06939"	21°02'01.48843"	371797.986	2329378.272
ML-D	89°46'18.28898"	21°01'53.81428"	372306.286	2329323.070
ML-E	89°46'21.27997"	21°01'50.64485"	372450.984	2329268.697
ML-F	89°46'28.12122"	21°01'40.89713"	372849.447	2329371.771
ML-G	89°46'07.65089"	21°02'11.18513"	372071.505	2329974.021
ML-H	89°45'14.10137"	21°01'57.89179"	371392.895	2329253.202
ML-I	89°45'25.85649"	21°02'09.64579"	371148.729	2329339.993
INT-A1	89°45'30.76423"	21°02'03.55887"	370989.083	2329447.823
INT-A2	89°45'34.96411"	21°01'57.13265"	371119.378	2329246.280
INT-B1	89°45'44.27815"	21°01'53.62483"	371368.838	2329136.336
INT-B2	89°45'50.35169"	21°01'57.18734"	371683.024	2329247.823
INT-C1	89°46'02.78647"	21°01'53.22460"	371621.043	2329122.802
INT-C2	89°46'06.59673"	21°01'47.87378"	372028.615	2329957.598
INT-C3	89°46'11.70289"	21°01'46.60075"	372175.431	2329729.685
INT-E1	89°46'24.57373"	21°01'46.09328"	372548.313	2329898.783
INT-F2	89°46'18.73259"	21°01'54.78943"	372381.748	2329167.274
INT-F3	89°46'13.16281"	21°02'03.18743"	372282.950	2329427.234
INT-G2	89°45'53.17959"	21°02'02.61403"	371646.002	2329419.800
INT-H1	89°45'41.72109"	21°02'01.19689"	371314.826	2329323.703

16/10/15  
16/11/15  
D/O Deputy Director Mines  
Jajpur Road

REVENUE INSPECTOR  
KARKAPAL

Forest Officer  
Ransol Section

Forest Officer  
Sukinda

LEGEND	
	ML PILLAR
	DUMP
	ML BOUNDARY
	DUMP AREA
	QUARRY

DGPS SURVEY CONDUCTED BY

**DIGITAL CARTOGRAPHY AND SERVICES (DCS) PVT.LTD**

1015, Bhagabat Sadhan,  
GGP Canal Road, Rautapalli, Bhubaneswar-75

xxv. 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. During 2016-17 IME done for 346 employee and 238 PME done.

**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 7<sup>th</sup> Nove-2014(Annexure-V). In addition to that a sum of Rs 27,71,909/- was deposited towards payment for implementation of Regional Wildlife Management Plan (Annexure-VI).

**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.

**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 61.0 lakh incurred during 2016-17 toward various activities under CSR .

#### Photos Showing CSR Activities







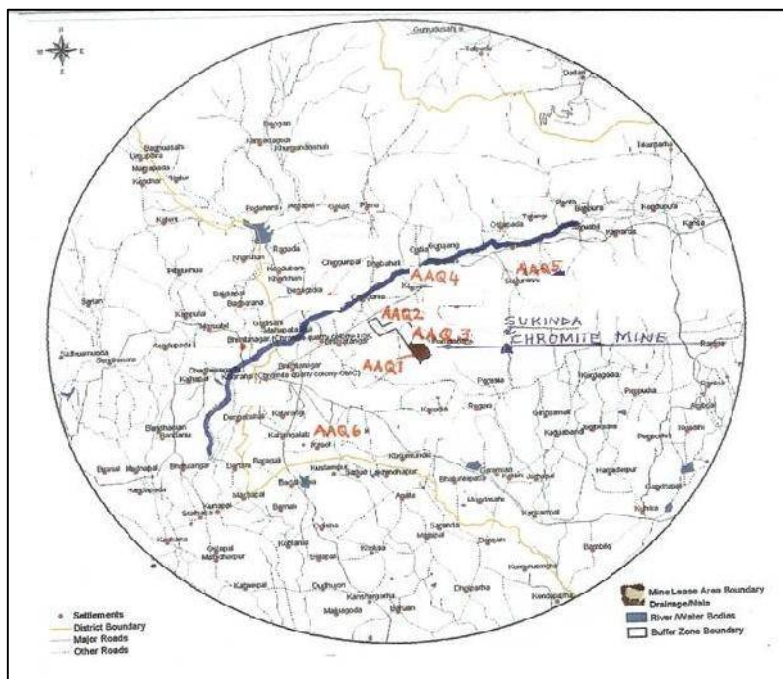
## **General Conditions & their Status:**

- 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, SO<sub>2</sub>, NO<sub>x</sub>, CO, NH<sub>3</sub> & O<sub>3</sub> are being done by establishing 6 ambient air monitoring stations on the basis of meteorological data, 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 April to September,2016 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 15**.

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

Sl No	Location	Station Code	Oct 16		NOV 16		Dec 16		Jan 17		Feb,17		March,17	
			Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
<b>Buffer Zone Ambient Noise (Results in dBA) Norm : Day-55, Night-45</b>														
1	Mines Office	ANL 1	47.8	31.8	46.2	32.1	46	32	47.1	31.7	45.6	30.8	45.1	31.4
2	Village Kaliapani	ANL 2	50	32	49.1	33	49.3	33.3	47.9	31.9	48.9	31.4	48.9	31.8
3	Village Sukrangi	ANL 3	45.3	31.8	45.2	30.9	45.3	31.2	46.0	31.3	47.3	32.0	47.2	31.9
4	Village Ransol	ANL 4	45.6	30.9	44.5	30.2	44.7	31.4	48.5	32.9	45.4	33.0	45.1	32.1
5	Village Tisco Hutting	ANL 5	47.7	32.8	48.5	32.9	49.5	33	48.4	32.7	48.1	33.9	48.4	33.7



Core-Zone		Work zone (Results in dBA) Norm:Day:75, Night:70												
1	O/C Quarry	WNL 1	65.8	60.1	32.1	61.8	63.8	61.6	64.9	64.3	63.5	61.8	63.7	61.9
2	Dumper Operation	WNL 2	68.1	61.9	33	66.4	65.9	65.2	68.8	66.0	66.1	65.6	66.3	64.3
3	Loader Operation	WNL 3	70.4	67.9	30.9	67.9	69.9	67.8	70.6	66.9	71.0	67.5	70.9	66.5
4	DG Set	WNL 4	70.9	67.7	30.2	65.2	68.9	66.6	68.7	64.8	68.9	65.3	68.4	65.1
5	Electric Pump	WNL 5	64.2	59.8	32.9	64.7	67.1	65.2	69.1	67.3	68.0	64.3	67.7	63.6
6	Loading Point	WNL 6	71.9	67.9	68.9	63.9	70.2	67.4	70.9	67.0	70.6	63.9	71.1	63.7
7	COB Plant	WNL 7	66.7	61.7	66.3	63	68.3	62.7	69.0	65.3	67.3	63.3	67.1	63.3

### SHOWING WORKERS WORKING WITH PPE



- 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**

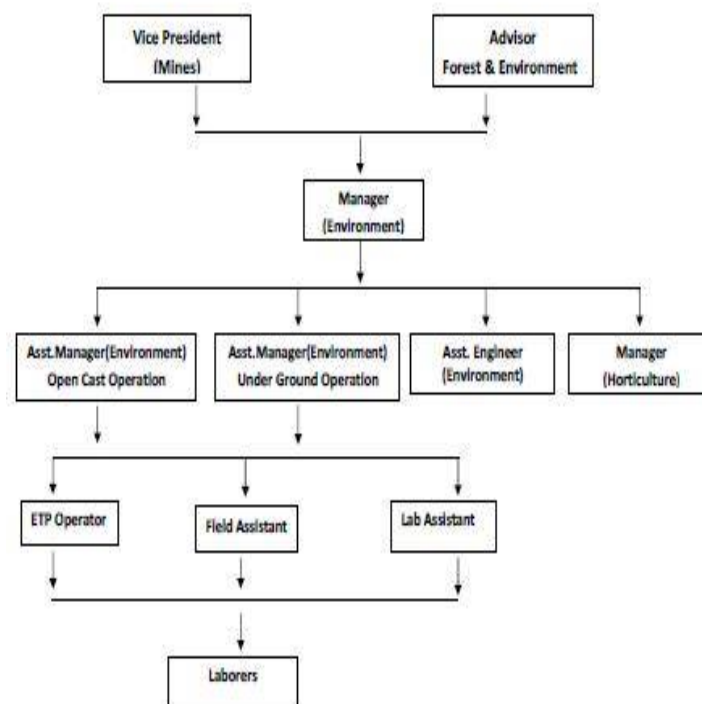
observe any contractions due to exposure to dust and take corrective measures, if needed.

**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-16**.



**[Table-16: Expenditure on EMP]**

<b>Kaliapani Chromite Mines/s Balasore Alloys Ltd</b>			
<b>Details of Expenditure Made Towards Protection of Environment(Rupees in Lakh)</b>			
<b>Sl No</b>	<b>Activity</b>	<b>Sub-Activities</b>	<b>Oct.16 to March,2017</b>
1	Protection Measures for Water Pollution	Fixed type water sprinklers installation/maintenance	0.15
		Dry-fog system installation / maintenance	0.10
		Expenditure towards deployment of water tankers for water sprinkling including recurring expenditure	15.00
2	Dump Management	Construction /Maintenance of check dams, garlanding drain& Retaining wall,etc	5.0
		Coirmatting	0.0
		Grass turffing	0.0
3	Plantation	Inside ML area Plantation(Dump slope, Safety zone incl maintenance)	2.0
		Out ML area plantation(Avenue & Block)	1.0
4	Protective Measures for Water Pollution	ETP Operation and Maintenance(incl Chemical Cost)	22.6
		Surface Run Off Management	0.50
5	Training & Awareness	Training	0.20
		Awareness	0.25
6	Occupational Health & Hygiene	IME/PME	9.40
		Drinking Water facility	1.0
		Medicine/First aid	1.5
8	Environmental Monitoring	Water,Air,Soil, Noise	9.0
		Maintenance of Equipment	0.7
9	Other Expenses	Statutory Payment	3.7
Total			72.1

- 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-17**.

**[Table-17: The status of six monthly EC compliance submissions]**

<b>Period</b>	<b>Letter no.</b>	<b>Date of submission</b>
<b>April,2016 to Sept,2016</b>	<b>BAL/MINES/MoEF &amp; CC/3915</b>	<b>28.11.2016</b>
<b>Oct,2015 to March,2016</b>	<b>BAL/Mines/141</b>	<b>30.05.2016</b>
April,2015 to September,2015	BAL/Mines/387	1.12.2015
October 2014 to March 2015	BAL/MINES/2376	28.05.2015
April 2014 to September 2014	BAL/MINES/1825	29.11.2014
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 URL for the same is [http://www.balasurealloys.com/webpage.php?title=Environment+Policy&p\\_type=1&parent=36&catid=78](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.

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.

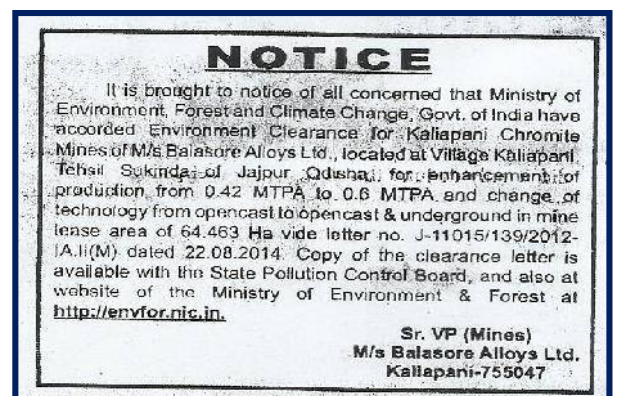
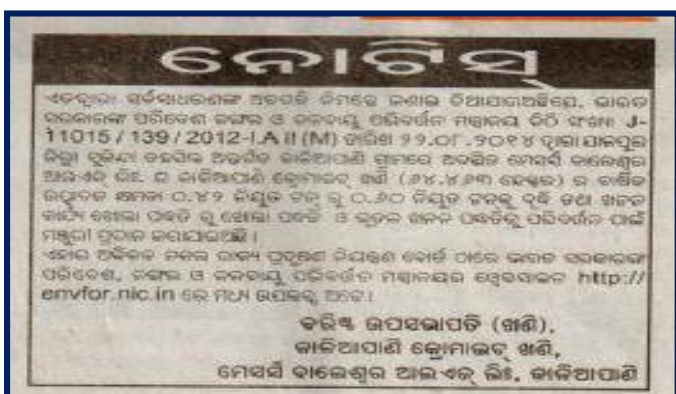
Status- Agreed.

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 31<sup>st</sup> 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 31<sup>st</sup> March 2015-16 is attached as Annexure- VIII.

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.



## ANNEXURE-I: NOC FOR GROUND WATER WITHDRAWAL



SUPERINTENDING HYDROGEOLOGIST

भारत सरकार  
केन्द्रीय भूमि जल प्राधिकरण  
जल संसाधन, नदी विकास  
और गंगा संरक्षण मंत्रालय

Government of India  
Central Ground Water Authority  
Ministry of Water Resources,  
River Development & Ganga Rejuvenation

File No:- 21-4/819/OR/MIN/2015- 1835

NOC No:- CGWA/NOC/MIN/ORIG/2015/2122

Dated: - 10/12/2015

10 DEC 2015

To,

Sr. Vice President (Mines),  
Kaliapani Chromite Mines,  
M/s Balasore Alloys Ltd., Po- Kaliapani,  
Sub-District Sukinda, District Jajapur,  
State Odisha,  
Pincode - 755047

Sub:- NOC for ground water withdrawal to M/s Balasore Alloys Ltd., in respect of their Kaliapani Chromite Mine located at Village Kaliapani (CT), Sub-District Sukinda, District Jajapur, State Odisha – reg.

Refer to your application on the above cited subject. Based on recommendations of Regional Director, Central Ground Water Board, South Eastern Region, Bhubaneswar vide their recommendations dated 13/10/2015 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 Kaliapani (CT), Sub-District Sukinda, District Jajapur, State Odisha. The NOC is, however subject to the following conditions:-

1. The firm may abstract 105.00 cu.m/day of ground water through 1 proposed borewell and 3188.00 cu.m/day through dewatering the mine seepage on account of mining intersecting the water table. The total withdrawal should not exceed 3293.00 cu.m/day (not exceeding 1201945.00 cu.m/year). No additional dewatering and no additional ground water abstraction structures to be constructed for this purpose without prior approval of the CGWA.
2. The dewatering structure as well borewell to be fitted with water meter by the firm at its own cost and monitoring of ground water abstraction to be under taken 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 atleast to the tune of 41,050 m<sup>3</sup>/year as proposed for augmenting the ground water resources of the area within six months from the date of issue of this letter. Treated water from ETP shall not be used for ground water recharge.
4. The photographs of the recharge structures after completion of the same are to be

West Block - 2, Wing - 3, Sector - 1, R.K. Puram, New Delhi - 110066

Tel : 011-26175362, 26175373, 26175379 • Fax : 011-26175369

Website : [www.cgwa-noc.gov.in](http://www.cgwa-noc.gov.in)

साथ सुरक्षित जल - सुन्दर धरातल कल

CONSERVE WATER - SAVE LIFE



## ANNEXURE-II: CONSENT TO ESTABLISH FROM SPCB, ODISHA



BY REGD POST

OFFICE OF THE  
STATE POLLUTION CONTROL BOARD, ODISHA  
Parivesh Bhawan, AJ118, 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

BY Reg. Post with A.D.



Tel : 0674-2564033  
FAX : 0674-2564033/2564573  
EPABX : 2561909/2562847  
E-mail: paribesh1@ospcbboard.org  
Website: www.ospcbboard.org

## STATE POLLUTION CONTROL BOARD, ODISHA

[DEPARTMENT OF FOREST & ENVIRONMENT, GOVERNMENT OF ODISHA]

Paribesh Bhawan, A/118, Nilakanta Nagar, Unit - VII  
Bhubaneswar - 751 022, INDIA

No. 1073 / Ind. I con. 2576 Date: 19-01-2017

To:

The Sr. Vice President (Mines),  
Kaliapani Chromite Mines of M/s. Balasore Alloys Limited,  
Module C1, 1<sup>st</sup> Floor, Fortune Tower,  
Bhubaneswar-23, Odisha

Sub: Extension of validity period of CTO order issued vide letter No. 15398 dated 20.10.2016

Ref: i. Consent Order vide Board's Letter No. 15398 Dated 20.10.2016  
ii. Online reply dated 18.01.2017

Sir,

This has reference to your request for consideration of extension of validity period of consent to operate order issued by SPCB, Odisha vide letter No.15398 dated 20.10.2016. In this context, this is to inform that in view of interim order passed by the Hon'ble High Court of Orissa on 16.01.2017 in the matter of W.P. (C) 4157/2016, the Board is pleased to extend the validity period of CTO order issued vide this office letter No.15398 dated 20.10.2016 up to 31.03.2018 subject to final outcome of the said Writ Petition. The conditions imposed in the original consent order issued vide letter under reference shall remain unchanged.

Yours faithfully,

MEMBER SECRETARY

Memo No. \_\_\_\_\_ /Dt. \_\_\_\_\_ /

Copy forwarded to:

- i) Regional Officer, State Pollution Control Board, Kalinganagar
- ii) District Collector, Jajpur
- iii) Director of Mines, Govt. of Odisha, Bhubaneswar,
- iv) Director, Environment -cum-Special Secretary, F & E. Deptt. Govt. of Odisha, Bhubaneswar.
- v) D.F.O, Cuttack
- vi) Deputy Director of Mines, Jajpur Road
- vii) Cess Section (Head Office)
- viii) Sr. Env. Engineer-L-I (C) (Hazardous waste cell)
- ix) Sr. Env. Scientist -L-I (L), Central Lab. SPCB, Bhubaneswar
- x) Consent Register

SR. ENV. SCIENTIST (MINES)



## ANNEXURE-IV: STP water analysis report



**ECOLOGICAL DEVELOPMENT CONSULTANCY PVT. LTD.**

Empanelled by SPCB, Odisha-Grade "A".

(ISO 9001:2008, OHSAS 18001 Certified Company)

Ecological Development

Head Office : Plot No- 1666, Vibaba Estate Lane, Nilakantheswar Merg,  
Delta Colony, Barmunda, Bhubaneswar -751003 , Khurdha, Odisha

EDC/2017/300/1438

18.01.2017

- Name of the Mine : Kaliapani Chromite Mine
- Name of the industry : M/s Balasore Alloys Ltd.
- Type of Sample : Outlet of STP
- Sample Collected by : M/s Balasore Alloys Ltd.
- Sample Analysed by : M/s Ecological Development Consultancy Pvt. Ltd.
- Date of Sampling : 09.01.2017
- Date of Analysis : 10.01.2017

### ANALYSIS RESULTS OF WASTE WATER

Sl. No.	Parameter	Unit	Standard Methods	Results
1.	pH	—	APHA 4500-H <sup>+</sup> (B)	7.2
2.	Total Suspended Solid (TSS)	mg/l	APHA 2540 (D)	13
3.	BOD 3 days @27°C	mg/l	APHA 5210 (B)	20
4.	Chemical Oxygen Demand (COD)	mg/l	APHA 5220 (D)	55
5.	Oil & Grease	mg/l	APHA 5520 (B)	2.8
6.	Total Coliform	MPN/100 ml	APHA 9221 (B)	35



For ED Consultancy Pvt. Ltd

*[Signature]*  
18.1.17  
Lab-In-Charge.

Tel. : (0674) 2565226; 08763213647

E-mail: edcbbsr@gmail.com, dayanantapandey@gmail.com

You are Sure. So here ...

## Annexure-V : APPROVAL LETTER OF SITE SPECIFIC WILDLIFE CONSERVATION PLAN

OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS (WILDLIFE)  
& CHIEF WILDLIFE WARDEN, ODISHA, BDA APARTMENT, 5<sup>TH</sup> 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 71 WL(C)SSP-425/2014  
Dated, Bhubaneswar, the 7<sup>th</sup> 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        |
| <b>Grand Total:</b>   | <b>₹254.18 lakh</b> |

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



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

OFFICE OF THE DIVISIONAL FOREST OFFICER: CUTTACK FOREST DIVISION  
GHATAKULA: NUAPARA: CUTTACK

Memo 7581 /SF (Misc.)  
Dated, Cuttack, the 2<sup>ND</sup> Spetemeber 2013

To  
The Addl.Chief Conservator of Forests,  
Forest Diversion and Nodal Officer, FC Act,  
O/O-the Pr. Chief Conservator of Forests,  
Odisha Bhubaneswar.


Sub: Implementation of Wildlife Management Plan in the Mining area  
at Project cost.

X-Sub: Payment of cost of Wildlife Management Plan in respect of lease  
for Chromite Mines of M/S Ispat Alloys now renamed as  
M/S Balasore Alloys Ltd.

Ref: Letter No.10F (Cons)-81/2004-6495/F&E Dt.23.03.2008 of Govt.  
of Orissa Forest & Environment Department & your office memo  
no.8664 Dt.02.05.2008.


As per the instruction contained in the above memo, the User Agency, M/S Balasore Alloys Ltd. Dist. - Jajpur was asked to submit the cost of Wildlife Management Plan to make payment towards cost of Wildlife Management Plan over 64.463 ha. (64.743 ha. mentioned in the demand notice which is a typographical error) of M.L. area in respect of Kaliapani Chromite Mines. Accordingly the User Agency has deposited the cost of Wildlife Management Plan through RTGS in favour of "Compensatory Afforestation Fund (CAF)-Orissa. Account No. C.A-25222 in Corporation Bank, Lodhi Road, New Delhi amounting to Rs. 1289260 /- (Rupees twelve lakh eighty nine thousand two hundred sixty) only" and the copy of the receipt is sent herewith for favour of kind information and necessary action.

Encl: As above

  
DIVISIONAL FOREST OFFICER  
CUTTACK FOREST DIVISION


Memo No. \_\_\_\_\_ /Dt.

Copy forwarded to the Regional Chief Conservator of Forests, Angul Circle, Angul for favour of kind information and necessary action.

  
DIVISIONAL FOREST OFFICER  
CUTTACK FOREST DIVISION

Memo No. 7581 /Dt. 02-9-13

Copy forwarded to the Vice -President (Mines), M/S Balasore Alloys Pvt. Ltd., 199, Forest Park, Bhubaneswar for info5rmation and necessary action with reference to his letter No.BAL/MINES/716/2013 Dt.16.08.2013.

  
DIVISIONAL FOREST OFFICER  
CUTTACK FOREST DIVISION

ANNEXURE-VII: ENVIRONMENT STATEMENT SUBMITTED FOR THE YEAR 2015-16

**BALASORE ALLOYS LIMITED**



Ref No: BAL/Mines/241

Dated: 27.9.2016

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

Sub: Submission of Environmental Statement in Form-V with respect to our Kaliapani Chromite Mines, M/s Balasore Alloys Ltd for the financial year 2015-16.

Ref: *Consent to Operate Vide No No: 4712/IND\_1-CON-2576 dated 17.3.2016 Consent Order No. 1239*

Dear Sir,

Please find enclosed herewith the Environmental Statement in Form - V for the financial year 2015-16 with respect to our Kaliapani Chromite Mines, M/S. Balasore Alloys Ltd, Kaliapani, Jajpur for your kind perusal.

Thanking you with regards

Yours faithfully  
For M/s Balasore Alloys Ltd

Anantnath Dhar  
Mines Manger

Encl: As above

Copy to: The Regional Officer, Kalinganagar, OSPCB.








You are Here > Home > Sustainability > Environment Policy

Find us on    

## Environment Policy

Environment Policy 2012			
<b>Environment Compliance's at Mines:</b>			<b>Name of the Contact Persons :</b>
Environmental Clearance by MoEF - Kalapani Chromite Mines-Under Ground Mining			President (Mines)
Environmental Clearance by MoEF - Ispat Sukinda Chromite Mines			Cell :
Environmental Clearance by MoEF - Kalapani Chromite Mines			Email:
Half Yearly EC Compliance Report to MoEF October'11 to March'12			
Half Yearly EC Compliance Report to MoEF April'12 to September'12			
Half Yearly EC Compliance Report to MoEF October'12 to March'13			
Environmental Statement submitted to SPCB (2013-2014)			<b>Mr. Basanta K Parida</b> Deputy General Manager (Mines) Cell : 7381096008 Email : basant.parida@balasoalloys.com

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