



BAL/Mines/387/2015-16

Dated: 28.11.2015

To

The Director (S),
Ministry of Environment, Forests & CC
Eastern Regional office,
A/3, Chandrasekharpur,
BHUBANESWAR – 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 April 2015 – September 2015.

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 April 2015 – September 2015, 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

SIX MONTHLY COMPLIANCE REPORT

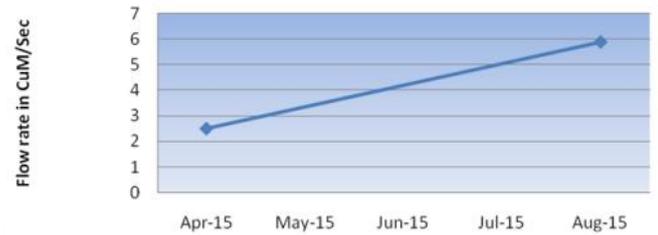
“ENVIRONMENTAL CLEARANCE”

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

For the Period April' 2015 to September'2015



Damsala U/S



	Apr-15	Aug-15
Damsala U/S	2.51	5.9

Kaliapani Chromite Mine
M/s Balasore Alloys Ltd



Submitted to:

Regional Office
MoEF & CC, BBSR

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ENVIRONMENTAL POLICY



We at Balasore Alloys Ltd, engaged in manufacturing of Ferro-Alloys, are committed to maintain clean and green environment in and around our plant & mines while striving to add value to all stakeholders and fostering corporate image worldwide.

In order to achieve the same we shall;

- Prevent pollution & protect environment through optimum resource utilization, minimization of emission, efficient waste management & development of green belt in and around our plant & mines.
- Comply to all applicable legal & other requirements to which organization subscribes.
- Develop among employees and surrounding community an awareness of environmental responsibility and adherence to sound environmental practices.
- Continually improve our environment management system performance.

Anil Sureka
Managing Director

9th Nov 2012



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 30.09.2015

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 No-Objection certificate vide letter No: 21-4(44)/SER/CGWA/2008-1845 Dt.10.10.2013 from Central Ground Water Authority, Govt. Of India, Ministry Of Water Resource, for drawl of ground water of for 347.2 m³/Day (294.2 m³/Day from Mine Dewater & 53 m³/Day from Borewell) & intersection of ground water table during mining activity. 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 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. Analysis of the inlet & outlet water to ETP is also being done regularly in-house as well as third party and the report is furnished as per the format supplied by OSPCB with submission of report to OSPCB on weekly basis.

The analysis report is as follows in **Table-1.**



[TABLE: 1: Daily ETP water analysis report]

ETP Water Quality (In-Let & Out-Let) For the Period April'15 To September'15

Kaliapani Chromite Mines, M/s Balasore Alloys Ltd.

Date	ETP Inlet							ETP Outlet					
	Parameters	pH	TSS	Cr ⁺⁶	Total Cr	Total Fe	Oil & Grease	pH	TSS	Cr ⁺⁶	Total Cr	Total Fe	Oil & Grease
	Unit	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
	Prescribed Standards	5.5-9.0	100	0.05	2	3	10	5.5-9.0	100	0.05	2	3	10
Apr-15													
01.04.2015	7.54	108	0.654	1.008	0.057	<1	7.12	46	0.016	0.096	0.506	<1	
02.04.2015	8.02	82	0.694	0.964	0.084	<1	7.87	52	0.008	0.104	0.781	<1	
03.04.2015	6.92	79	0.314	0.740	0.121	<1	6.54	54	0.018	0.082	0.992	<1	
04.04.2015	7.29	99	0.960	1.420	0.096	<1	7.11	52	0.010	0.124	0.554	<1	
05.04.2015	8.11	108	0.518	0.962	0.070	<1	7.26	47	0.016	0.088	1.088	<1	
06.04.2015	7.9	84	0.604	1.21	0.055	<1	7.62	52	0.004	0.060	2.134	<1	
07.04.2015	7.24	116	0.846	1.642	0.119	<1	7.11	42	0.016	0.126	0.818	<1	
08.04.2015	8.42	99	0.862	1.448	0.097	<1	8.27	50	0.012	0.106	1.826	<1	
09.04.2015	7.21	82	1.088	2.410	0.082	<1	7.04	46	0.018	0.110	0.660	<1	
10.04.2015	7.42	114	1.210	2.118	0.107	<1	7.18	40	0.010	0.088	1.910	<1	
11.04.2015	6.92	96	0.480	0.962	0.080	<1	6.30	47	0.014	0.102	0.741	<1	
12.04.2015	7.09	86	0.510	1.216	0.121	<1	6.82	40	0.020	0.090	0.581	<1	
13.04.2015	8.19	92	0.720	1.316	0.082	<1	8.04	44	0.026	0.168	1.292	<1	
14.04.2015	7.26	107	1.008	1.960	0.107	<1	7.12	48	0.014	0.084	2.016	<1	
15.04.2015	8.12	90	0.690	1.422	0.092	<1	7.42	51	0.022	0.108	1.198	<1	
16.04.2015	7.90	58	0.548	1.150	0.111	<1	7.84	44	0.010	0.082	2.412	<1	
17.04.2015	7.81	116	0.988	1.634	0.126	<1	7.24	40	0.014	0.106	1.294	<1	
18.04.2015	7.26	74	1.21	1.154	0.099	<1	6.89	51	0.020	0.102	1.846	<1	
19.04.2015	6.54	66	0.512	1.216	0.12	<1	6.22	50	0.016	0.074	1.986		
20.04.2015	7.96	79	0.648	0.990	0.057	<1	6.84	56	0.014	0.070	1.612	<1	
21.04.2015	6.82	100	0.962	1.346	0.090	<1	6.57	48	0.026	0.108	0.648	<1	
22.04.2015	6.90	87	1.120	1.916	0.127	<1	6.44	52	0.020	0.066	0.924	<1	
23.04.2015	6.86	76	0.926	1.420	0.089	<1	6.27	55	0.016	0.102	1.246	<1	
24.04.2015	6.85	80	0.644	1.248	0.092	<1	6.26	57	0.010	0.068	1.918	<1	
25.04.2015	7.72	102	0.632	1.440	0.049	<1	7.08	46	0.016	0.108	0.841	<1	
26.04.2015	6.99	84	0.810	1.626	0.107	<1	6.12	52	0.024	0.076	0.568	<1	



27.04.2015	7.16	82	1.156	2.642	0.059	<1	6.92	57	0.012	0.162	1.617	<1
28.04.2015	7.76	99	1.614	1.992	0.104	<1	6.99	44	0.012	0.160	0.986	<1
29.04.2015	7.48	84	1.310	2.116	0.1	<1	6.96	49	0.016	0.0700	0.990	<1
30.04.2015	6.96	69	0.433	0.818	0.068	<1	6.42	51	0.010	0.09	0.968	<1

May-15

01.05.2015	7.82	77	1.850	2.210	0.104	<1	7.12	46	0.014	0.102	0.671	<1
02.05.2015	7.12	102	0.968	2.348	0.081	<1	7.01	48	0.020	0.108	1.178	<1
03.05.2015	6.84	90	0.648	1.216	0.091	<1	6.26	42	0.012	0.120	0.987	<1
04.05.2015	6.97	81	0.780	1.718	0.103	<1	6.61	45	0.016	0.096	2.027	<1
05.05.2015	7.19	96	1.162	2.088	0.127	<1	7.01	48	0.024	0.200	0.986	<1
06.05.2015	8.12	81	0.516	1.516	0.059	<1	7.9	44	0.04	0.102	0.489	<1
07.05.2015	7.36	67	0.930	1.328	0.092	<1	7.24	41	0.024	0.088	0.776	<1
08.05.2015	8.12	92	0.736	1.016	0.107	<1	7.56	47	0.026	0.108	0.782	<1
09.05.2015	7.49	81	1.334	1.938	0.077	<1	7.21	45	0.030	0.060	0.982	<1
10.05.2015	8.07	104	1.626	2.412	0.069	<1	7.92	42	0.020	0.078	1.216	<1
11.05.2015	7.21	126	1.672	2.628	0.091	<1	7.10	48	0.020	0.056	0.506	<1
12.05.2015	7.96	96	1.018	2.128	0.058	<1	7.41	45	0.012	0.072	0.902	<1
13.05.2015	7.51	110	0.928	1.51	0.104	<1	7.39	44	0.016	0.078	0.792	<1
15.05.2015	7.82	99	0.716	1.192	0.086	<1	7.41	49	0.022	0.106	0.660	<1
16.05.2015	7.07	70	1.128	2.060	0.120	<1	6.98	46	0.012	0.560	0.687	<1
17.05.2015	7.40	72	1.422	1.926	0.386	<1	8.00	48	0.006	0.024	0.13	<1
18.05.2015	7.29	66	1.113	1.245	0.066	<1	7.17	49	0.024	0.1	1.612	<1
19.05.2015	7.65	69	0.962	1.312	0.107	<1	7.51	47	0.02	0.066	0.646	<1
20.05.2015	8.11	96	1.048	1.768	0.096	<1	7.69	48	0.018	0.092	0.695	<1
21.05.2015	8.09	116	1.400	2.680	0.162	<1	8.01	44	0.022	0.078	0.540	<1
22.05.2015	7.68	91	0.930	1.610	0.120	<1	7.56	47	0.004	0.026	1.628	<1
23.05.2015	8.27	76	0.876	1.364	0.079	<1	8.19	43	0.004	0.030	1.316	<1
24.05.2015	7.94	81	1.662	2.722	0.103	<1	7.61	42	0.014	0.070	0.829	<1
25.05.2015	7.81	86	1.138	1.916	0.096	<1	7.57	41	0.034	0.108	0.815	<1
26.05.2015	6.92	95	1.516	2.102	0.118	<1	6.75	43	0.018	0.096	0.639	<1
27.05.2015	7.32	72	0.958	1.62	0.121	<1	7.04	42	0.018	0.09	0.77	<1
28.05.2015	7.03	84	0.834	1.826	0.246	<1	6.58	42	0.016	0.098	0.743	<1
29.05.2015	7.79	96	1.046	1.194	0.181	<1	7.68	44	0.022	0.098	0.806	<1
30.05.2015	7.62	102	1.612	1.982	0.102	<1	7.1	47	0.01	0.08	2.018	<1
31.05.2015	7.19	79	0.682	0.984	0.056	<1	7.1	43	0.026	0.098	0.989	<1

Jun-15

01.06.2015	7.12	68	0.648	1.346	0.057	<1	7.04	48	0.020	0.092	0.688	<1
02.06.2015	6.98	96	0.59	1.208	0.162	<1	6.80	44	0.016	0.076	1.415	<1
03.06.2015	7.67	81	1.212	2.916	0.103	<1	7.12	43	0.024	0.104	1.618	<1
04.06.2015	6.96	64	0.596	1.910	0.102	<1	6.81	38	0.024	0.072	0.684	<1
05.06.2015	7.14	65	0.748	1.618	0.096	<1	7.10	42	0.028	0.064	0.719	<1
06.06.2015	7.26	70	1.236	2.002	0.116	<1	6.99	40	0.012	0.102	0.542	<1
07.06.2015	8	59	0.388	0.742	0.068	<1	7.94	38	0.008	0.098	0.612	<1
08.06.2015	7.96	79	0.986	1.388	0.124	<1	7.48	44	0.022	0.104	0.512	<1



Six Monthly Environment Compliance Report

09.06.2015	6.92	68	0.489	0.966	0.120	<1	6.71	49	0.010	0.078	0.819	<1
10.06.2015	7.08	62	0.120	1.912	0.087	<1	7.02	44	0.008	0.060	0.990	<1
11.06.2015	7.12	80	0.648	1.410	0.112	<1	7.10	46	0.018	0.098	0.916	<1
12.06.2015	7.26	92	0.72	1.348	0.119	<1	7.17	48	0.020	0.062	0.928	
13.06.2015	7.24	81	0.924	1.826	0.078	<1	7.02	47	0.018	0.076	1.215	<1
16.06.2015	7.96	56	0.616	1.098	0.100	<1	7.62	39	0.012	0.034	2.612	<1
17.06.2015	6.90	67	0.91	1.648	0.098	<1	6.84	44	0.024	0.104	1.009	<1
18.06.2015	7.54	80	1.094	2.028	0.129	<1	6.96	44	0.006	0.062	2.118	<1
19.06.2015	8.31	79	1.038	2.014	0.171	<1	6.62	50	0.022	0.102	1.926	<1
20.06.2015	8.34	81	1.183	1.998	0.072	<1	7.99	47	0.024	0.096	0.812	<1
21.06.2015	7.49	70	1.01	1.84	0.112	<1	7.10	46	0.02	0.062	0.889	<1
22.06.2015	8.09	81	1.384	1.924	0.360	<1	8.04	46	0.010	0.056	0.413	<1
23.06.2015	8.29	94	1.150	2.010	0.106	<1	8.25	47	0.020	0.100	0.444	<1
24.06.2015	8.01	57	1.124	1.818	0.170	<1	7.81	39	0.020	0.116	0.511	<1
25.06.2015	8.03	70	1.140	2.316	0.097	<1	7.39	46	0.016	0.098	0.705	<1
26.06.2015	7.94	56	0.828	1.402	0.104	<1	7.62	38	0.036	0.108	0.648	<1
27.06.2015	7.99	79	0.778	1.862	0.125	<1	7.96	46	0.032	0.096	0.74	<1
28.06.2015	8.21	95	0.746	1.428	0.152	<1	8.17	44	0.024	0.086	0.966	<1
29.06.2015	7.92	64	0.980	1.640	0.127	<1	7.87	37	0.020	0.058	0.816	<1
30.06.2015	8.26	60	1.916	2.116	0.120	<1	8.01	40	0.022	0.072	0.54	<1

Jul-15

01.07.2015	7.64	62	3.230	0.046	0.092	<1	6.09	36	0.010	0.046	1.624	<1
02.07.2015	7.64	59	0.962	1.654	0.107	<1	7.37	38	0.016	0.074	1.674	<1
03.07.2015	8.24	59	1.214	2.008	0.200	<1	8.09	32	0.03	0.010 8	0.862	<1
04.07.2015	7.96	67	0.864	1.644	0.119	<1	7.85	40	0.018	0.092	1.247	<1
06.07.2015	8.04	70	0.92	1.816	0.089	<1	8.03	44	0.026	0.096	1.09	<1
07.07.2015	7.96	58	0.894	1.632	0.068	<1	7.48	39	0.022	0.102	0.741	<1
08.07.2015	8.07	62	0.902	1.218	0.06	<1	8.01	40	0.008	0.036	1.885	<1
09.07.2015	7.86	58	1.292	2.010	0.120	<1	7.5	33	0.006	0.028	2.192	<1
10.07.2015	7.55	64	1.772	2.138	0.099	<1	5.95	37	0.002	0.026	1.826	<1
11.07.2015	6.83	69	0.590	1.202	0.103	<1	5.99	40	0.004	0.028	1.094	<1
12.07.2015	6.91	70	0.376	0.88	0.076	<1	6.06	45	0.006	0.034	0.878	<1
13.07.2015	7.61	62	0.628	1.31	0.06	<1	7.19	46	0.012	0.052	0.802	<1
14.07.2015	8.04	70	0.824	1.404	0.105	<1	7.92	38	0.006	0.04	1.618	<1
15.07.2015	7.18	68	1.204	2.116	0.88	<1	6.2	39	0.01	0.098	0.995	<1
16.07.2015	8.04	74	1.224	1.91	0.102	<1	7.9	45	0.006	0.076	1.092	<1
17.07.2015	7.92	69	1.016	1.724	0.081	<1	7.81	32	0.002	0.02	1.881	<1
19.07.2015	7.68	88	1.286	2.004	0.127	<1	6.92	40	0.002	0.016	1.926	<1
20.07.2015	8.19	60	1.14	2.62	0.06	<1	8.02	32	0.002	0.012	2.984	<1
21.07.2015	7.96	82	1.284	1.694	0.107	<1	7.2	46	0.01	0.066	0.88	<1
22.07.2015	7.46	59	1.188	2.124	0.132	<1	7.12	30	0.004	0.06	1.689	<1
23.07.2015	7.87	77	1.258	2.386	0.094	<1	6.72	45	0.012	0.092	2.01	<1
24.07.2015	8.02	90	1.216	2.382	0.057	<1	7.95	42	0.01	0.068	0.994	<1
25.07.2015	7.9	80	1.58	2.216	0.089	<1	6.84	38	0.02	0.1	0.816	<1



26.07.2015	8.23	81	1.084	1.99	0.078	<1	7.95	43	0.004	0.038	2.147	<1
27.07.2015	7.01	64	1.42	2.014	0.092	<1	6.98	46	0.016	0.06	0.874	<1
28.07.2015	7.56	92	1.972	2.216	0.067	<1	7.21	40	0.002	0.018	2.916	<1
29.07.2015	7.21	67	1.218	2.018	0.09	<1	6.9	36	0.012	0.084	1.916	<1
30.07.2015	6.99	56	0.91	1.386	0.101	<1	6.42	50	0.02	0.08	0.988	<1
31.07.2015	6.82	98	1.426	2.318	0.048	<1	6.21	42	0.006	0.092	1.994	<1
Aug-15												
01.08.2015	7.9	80	1.388	2.616	0.124	<1	7.21	44	0.018	0.096	0.681	<1
02.08.2015	8.21	72	0.942	1.092	0.096	<1	6.96	39	0.020	0.108	0.742	<1
03.08.2015	7.82	77	1.286	2.018	0.090	<1	6.96	50	0.040	0.104	0.682	<1
04.08.2015	5.98	92	1.546	2.024	0.088	<1	5.90	48	0.004	0.060	1.984	<1
05.08.2015	6.82	66	1.380	2.814	0.102	<1	6.21	40	0.010	0.060	1.368	<1
06.08.2015	7.9	74	1.314	2.416	0.074	<1	7.15	36	0.002	0.014	2.98	<1
07.08.2015	6.98	77	2.124	2.980	0.062	<1	6.9	42	0.02	0.096	0.587	<1
08.08.2015	7.21	90	1.904	2.698	0.090	<1	6.80	48	0.012	0.056	0.784	<1
09.08.2015	6.48	64	1.010	1.990	0.055	<1	6.19	38	0.020	0.084	1.13	<1
10.08.2015	7.96	96	1.096	2.166	0.094	<1	7.14	45	0.01	0.076	0.694	<1
11.08.2015	7.2	102	1.250	2.264	0.078	<1	7.02	47	0.004	0.06	0.98	<1
12.08.2015	6.49	96	1.372	2.416	0.102	<1	6.2	40	0.014	0.068	1.206	<1
13.08.2015	6.6	64	1.414	2.808	0.127	<1	6.39	45	0.022	0.064	0.689	<1
14.08.2015	6.89	92	1.21	2.004	0.11	<1	6.23	43	0.016	0.048	0.995	<1
15.08.2015	7.07	66	1.628	2.81	0.092	<1	6.91	46	0.008	0.036	1.616	<1
16.08.2015	6.84	72	0.99	2.668	0.125	<1	6.32	46	0.012	0.09	1.204	<1
17.08.2015	6.91	121	1.996	2.714	0.036	<1	6.48	44	0.012	0.026	1.452	<1
18.08.2015	6.92	101	1.98	5.21	0.02	<1	6.2	41	0.026	0.088	0.67	<1
19.08.2015	7.16	112	1.94	2.62	0.9	<1	6.98	43	0.021	0.028	1.296	<1
20.08.2015	6.95	101	2.11	3.118	0.086	<1	6.61	46	0.016	0.038	0.99	<1
21.08.2015	7.21	111	2.356	4.012	0.056	<1	7.19	44	0.016	0.024	2.132	<1
22.08.2015	7.49	103	1.812	5.21	0.112	<1	6.91	42	0.012	0.036	1.208	<1
23.08.2015	6.95	103	1.77	2.304	0.074	<1	6.9	45	0.02	0.082	0.996	<1
24.08.2015	7.33	90	1.516	2.602	0.068	<1	6.94	38	0.044	0.09	0.52	<1
25.08.2015	7.29	96	1.956	2.664	0.092	<1	6.71	46	0.008	0.04	1.96	<1
26.08.2015	7.04	84	1.18	2.462	0.036	<1	6.9	38	0.002	0.018	1.673	<1
27.08.2015	7.09	69	1.704	2.902	0.074	<1	7.04	40	0.01	0.046	1.21	<1
28.08.2015	7.3	76	1.528	2.308	0.03	<1	7.19	45	0.01	0.052	1.638	<1
29.08.2015	6.95	66	1.57	2.42	0.059	<1	6.6	36	0.016	0.04	0.914	<1
30.08.2015	7.15	90	1.548	2.6	0.11	<1	6.4	42	0.016	0.08	0.832	<1
31.08.2015	7.2	80	1.238	2.62	0.055	<1	6.79	38	0.04	0.102	0.647	<1
Sep-15												
01.09.2015	7.19	96	1.928	2.904	0.066	<1	6.30	45	0.012	0.068	1.195	<1
02.09.2015	7.21	84	1.31	2.624	0.044	<1	6.45	38	0.004	0.030	1.739	<1
03.09.2015	7.3	92	1.726	2.904	0.029	<1	6.94	48	0.010	0.038	1.416	<1
04.09.2015	6.96	76	1.212	2.404	0.062	<1	6.90	36	0.024	0.092	0.627	<1
05.09.2015	6.92	82	2.450	3.802	0.034	<1	6.30	40	0.006	0.042	1.41	<1



06.09.2015	6.82	77	1.912	2.180	0.056	<1	6.50	34	0.014	0.076	0.826	<1
07.09.2015	6.87	94	1.688	2.396	0.09	<1	6.36	48	0.004	0.012	1.76	<1
08.09.2015	6.9	62	1.720	2.342	0.050	<1	6.42	37	0.010	0.038	0.871	<1
09.09.2015	7.02	76	0.684	1.832	0.062	<1	6.26	50	0.008	0.03	1.212	<1
10.09.2015	7.34	69	1.416	2.41	0.039	<1	6.1	42	0.024	0.062	0.632	<1
11.09.2015	6.76	82	1.312	2.694	0.058	<1	6.29	46	0.014	0.08	0.928	<1
12.09.2015	6.84	97	1.724	2.196	0.04	<1	6.3	46	0.006	0.026	1.833	<1
13.09.2015	7.14	96	1.192	2.628	0.095	<1	6.49	39	0.006	0.026	1.424	<1
14.09.2015	7.36	84	1.382	2.69	0.046	<1	6.33	46	0.01	0.048	1.721	<1
15.09.2015	7.08	90	0.684	1.91	0.079	<1	6.48	49	0.034	0.096	0.562	<1
16.09.2015	6.94	82	0.924	1.21	0.103	<1	6.3	42	0.014	0.05	0.982	<1
19.09.2015	6.92	90	1.06	2.012	0.057	<1	6.1	40	0.036	0.062	0.619	<1
20.09.2015	7.14	89	0.686	1.344	0.066	<1	6.36	36	0.024	0.048	0.914	<1
21.09.2015	7.14	76	0.804	1.206	0.104	<1	6.61	50	0.006	0.024	1.325	<1
22.09.2015	8.46	79	0.864	1.512	0.044	<1	7.55	46	0.012	0.04	0.986	<1
23.09.2015	6.34	96	0.792	1.396	0.12	<1	5.96	52	0.004	0.012	1.788	<1
24.09.2015	6.61	80	0.766	1.288	0.18	<1	6.23	49	0.006	0.034	1.893	<1
25.09.2015	7.09	92	1.72	2.212	0.069	<1	6.91	49	0.022	0.064	0.642	<1
26.09.2015	7.14	84	0.792	1.398	0.055	<1	6.31	44	0.034	0.11	0.51	<1
27.09.2015	6.79	95	0.74	1.728	0.102	<1	6.3	39	0.04	0.128	0.499	<1
28.09.2015	6.99	86	0.754	1.096	0.036	<1	6.32	42	0.004	0.024	1.815	<1
29.09.2015	6.7	77	0.916	1.298	0.062	<1	6.3	36	0.008	0.044	1.317	<1
30.09.2015	6.94	82	0.518	1.004	0.097	<1	6.37	39	0.006	0.042	1.518	<1

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 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-2**.

[Table-2: Drinking Water Analysis Report]

Drinking Water Analysis Report (April-2015 to September 2015)

M/s Balasore Alloys Limited

Kaliapani Chromite Mines

Station 1:Administrative Building

SL · N O	PARAMETERS	UNIT S	STANDARD S						
			(IS:10500)	15- Apr	15-May	15-Jun	15-Jul	15-Aug	15-Sep
1	pH	-	6.5-8.5	7.08	6.78	6.37	7.1	7.31	6.96
2	Odour	-	Unobjectionable	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	2	4	6	8	4
6	Chloride(as Cl)	Mg/L	250(max)	5.2	5.8	6.1	5.6	5.8	5.2
7	Residual Free Chlorine	Mg/L	0.2(min)	ND	ND	ND	ND	ND	
8	Total Dissolved Solids	Mg/L	500(max)	122	142	139	145	150	128
9	Total Hardness(as CaCO ₃)	Mg/L	300(max)	45	50	61	58	60	56
10	Iron(as Fe)	Mg/L	0.3(max)	0.21	0.18	0.16	0.19	0.22	14
11	Calcium(as Ca)	Mg/L	75(max)	11.5	12.6	12.6	12.8	13.1	12.2
12	Magnesium(as Mg)	Mg/L	30(max)	6.2	6.5	6.5	7.2	7.4	6.8
13	Sulphate(as SO ₄)	Mg/L	200(max)	10.5	10.9	12	12.2	12.8	10.2
14	Manganese(as Mn)	Mg/L	0.1(max)	BDL	<0.0000 1	<0.0000 1	<0.0000 1	<0.0000 1	<0.0000 1
15	Nitrate(as NO ₃)	Mg/L	45(max)	0.35	0.3	0.28	0.3	0.32	0.28
16	Alkalinity(as CaCO ₃)	Mg/L	200(max)	26	24	29	33	35	20
17	Chromium(as Cr ⁶⁺)	Mg/L	0.05	0.01 4	0.012	0.01	0.02	0.022	0.01
18	Fluorides(as F)	Mg/L	1.5	BDL	<0.001	<0.001	<0.001	<0.001	<0.001
19	Cadmium(as Cd)	Mg/L	0.01(max)	BDL	<0.0000 1	<0.0000 1	<0.0000 1	<0.0000 1	<0.0000 1
20	Copper(as Cu)	Mg/L	0.05(max)	BDL	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
21	Zinc(as Zn)	Mg/L	5(max)	0.21	0.18	0.14	0.18	0.19	0.12
22	Lead(as Pb)	Mg/L	0.05(max)	BDL	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
23	Selenium(as Se)	Mg/L	0.01(max)	BDL	<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)	BDL	<0.0000 1	<0.0000 1	<0.0000 1	<0.0000 1	<0.0000 1
26	Cyanide(as CN)	Mg/L	0.05(max)	BDL	<0.002	<0.002	<0.002	<0.002	<0.002
27	Boron	Mg/L	1(max)	BDL	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
28	Arsenic(as As)	Mg/L	0.05	BDL	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
29	Phosphorous	Mg/L	....		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001



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

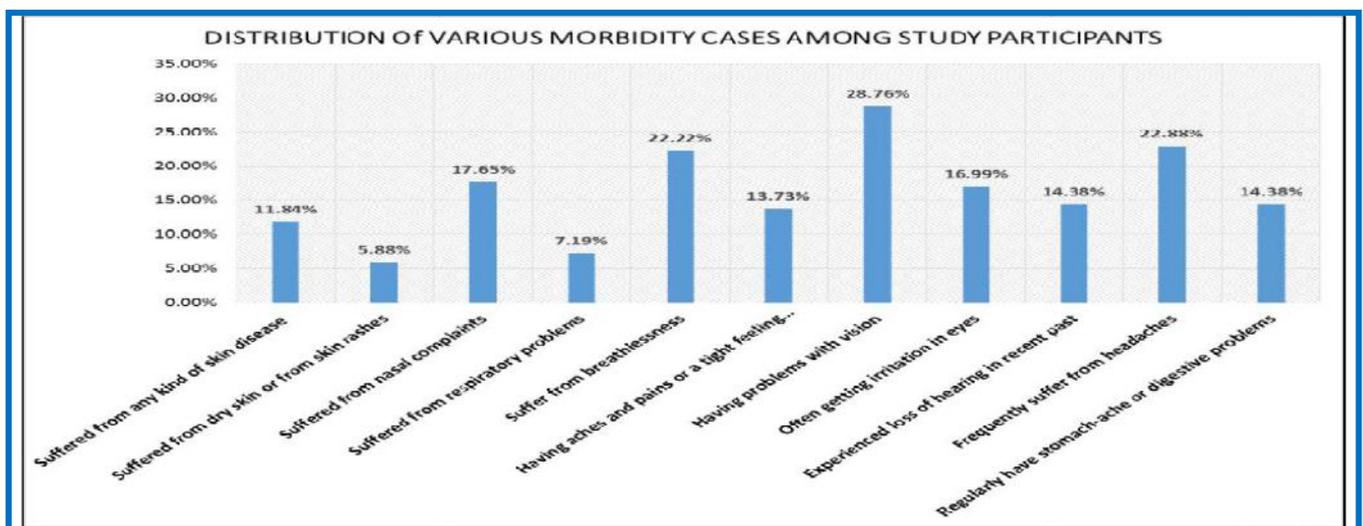
Status- A morbidity pattern study has been done during November & December 2014 by engaging Asian Institute of Public Health, Bhubaneswar with overall aim to create baseline data base on current status of occupational health risks especially morbidity pattern with regard to Chromium and air born dust 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:



Morbidity	% of Morbidity
Suffered from any kind of skin disease	11.84%
Suffered from dry skin or from skin rashes	5.88%
Suffered from nasal complaints	17.65%
Suffered from respiratory problems	7.19%
Suffer from breathlessness	22.22%
Having aches and pains or a tight feeling in the chest or around the heart	13.73%
Having problems with vision	28.76%
Often getting irritation in eyes	16.99%
Experienced loss of hearing in recent past	14.38%
Frequently suffer from headaches	22.88%
Regularly have stomach-ache or digestive problems	14.38%

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- For treatment of Cr+6 in mine discharge water an up graded Effluent Treatment Plant of capacity 445KL/Hr has been established with the recommendation of IIT, Kharagpur. The raw water from mines is properly treated in the ETP for the removal of hexavalent chromium. Online monitoring device is also installed at the in-let & out-let of the ETP for continuous monitoring of the quality & quantity of water as per the Guidelines for Real-time Effluent Quality Monitoring System by CPCB. .

Analysis of the inlet & outlet water to ETP is also being done regularly in-house as well as third party. The analysis report of treated water is given in **Table-1**.

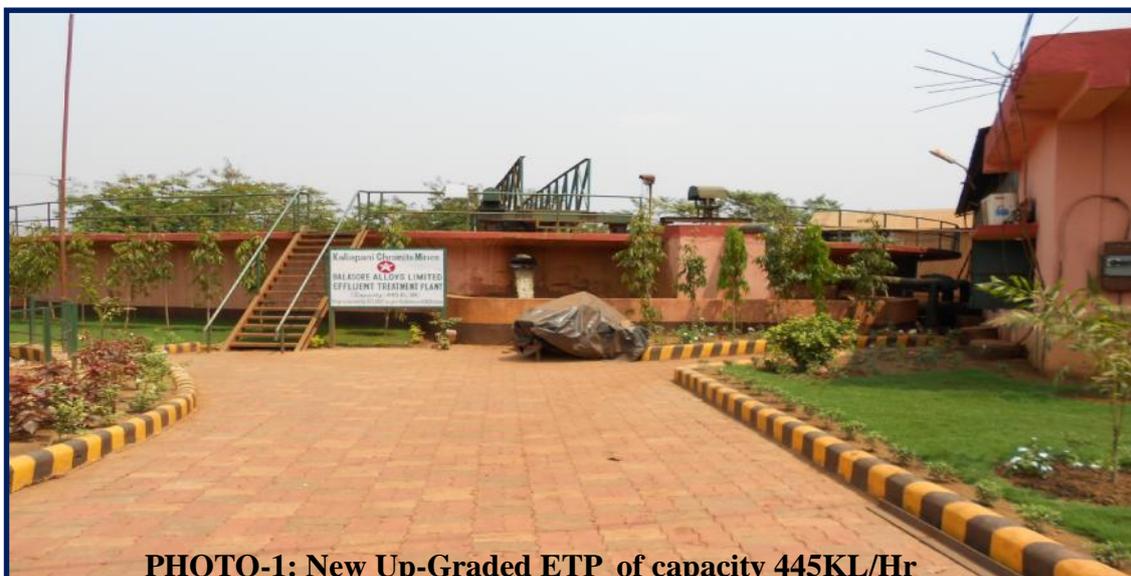


PHOTO-1: New Up-Graded ETP of capacity 445KL/Hr

Figure-1: New up-graded ETP of capacity 445KL/Hr Process Flow Diagram



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-3**. The photo of the same is shown as **Photo: 3**.

[Table-3: 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 SHOWING CHANELISATION OF SURFACE RUNOFF



**SURFACE RUN-OFF
MANAGEMENT FROM
TAILING POND AREA
DUMP NO.- 05**



PHOTO SHOWING CHANELISATION OF SURFACE RUNOFF



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



PHOTO-3: Showing channelization of surface run-off to ETP through settling pit From Dumping Area

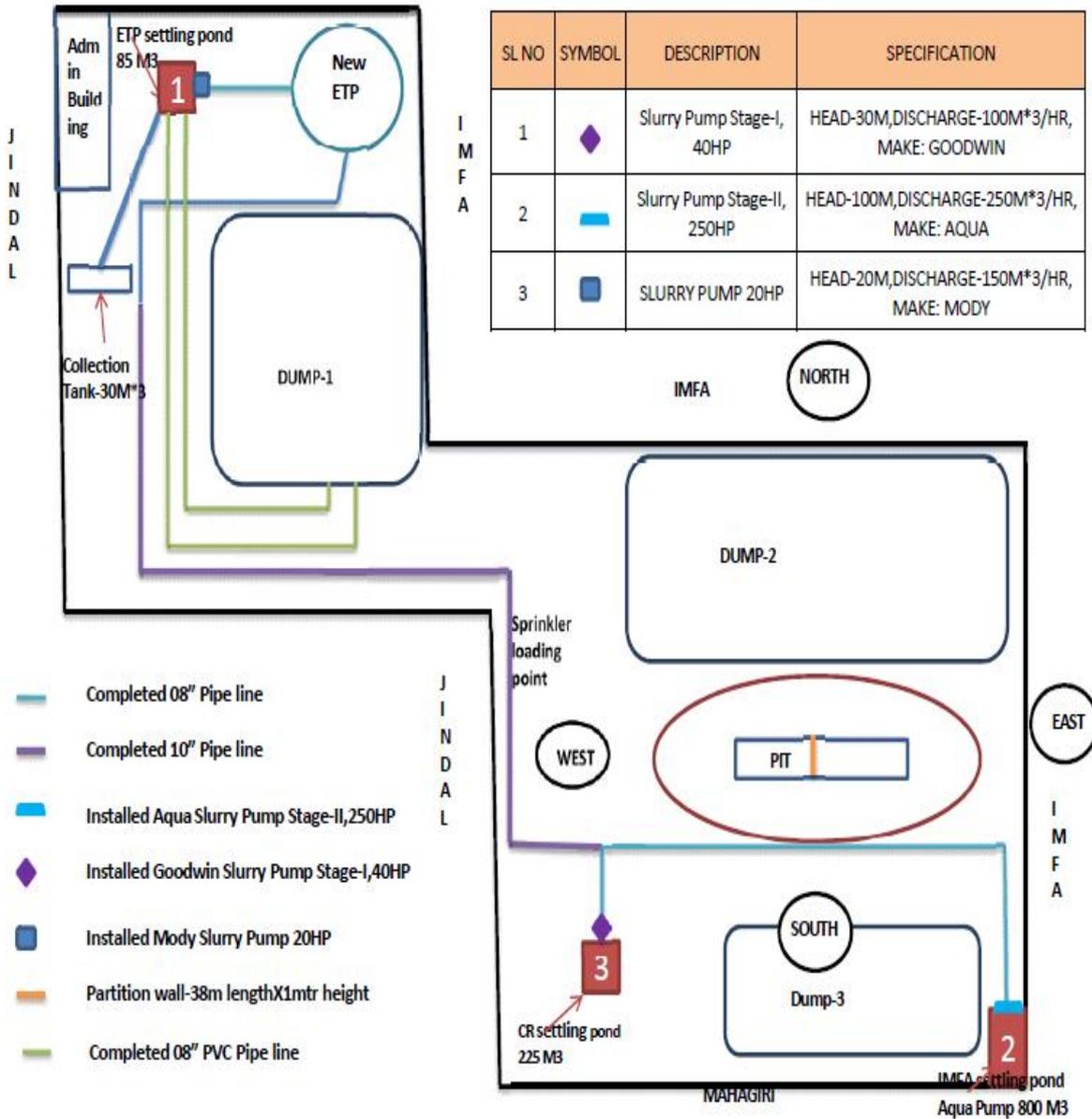


Figure-2: Showing Lay-out of Surface Run-off Management

- 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 & 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.

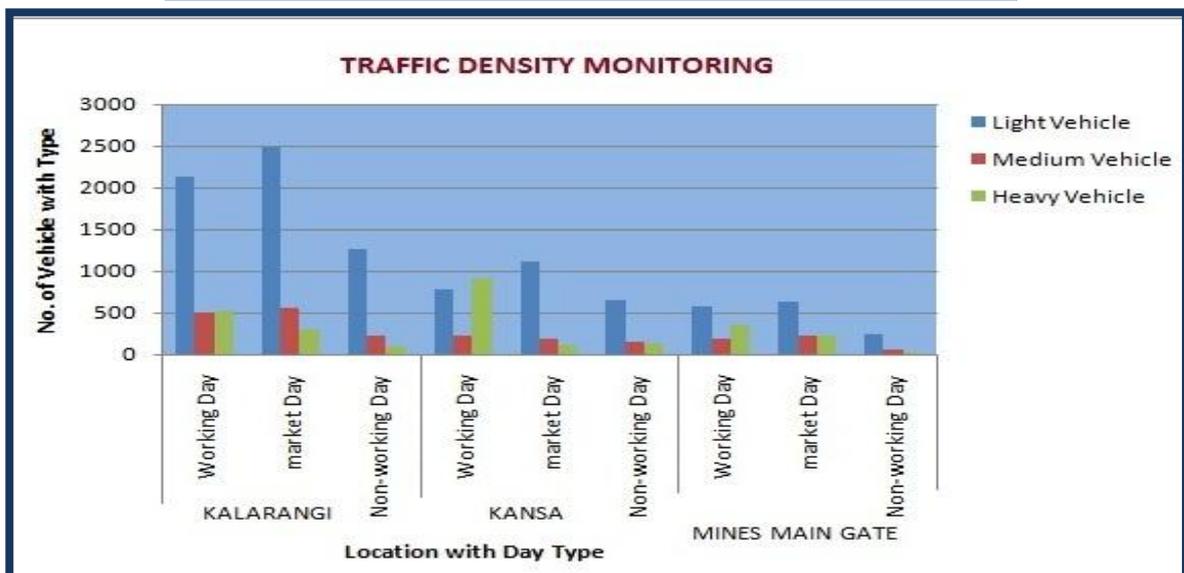
- vii. **Traffic density on the route of mineral transportation shall be regularly monitored and report shall be submitted along with compliance report.**

Status- Traffic density is being monitored on the route of mineral transportation at three locations and the monitoring report is given in **Table-4**.

[Table-4: Traffic Density Monitoring Report]

TRAFFIC DENSITY MONITORING REPORT							
M/s BALASORE ALLYS LIMITED							
KALIAPANI CHROMITE MINES							
Sl. No.	Location	Date	Day	Light Vehicle	Medium Vehicle	Heavy Vehicle	Total
1	KALARANGI	30.03.2015	Working Day	2126	491	519	3136
		18.04.2015	market Day	2474	547	293	3314
		19.04.2015	Non-working Day	1256	223	100	1579
2	KANSA	30.03.2015	Working Day	775	226	899	1900
		18.04.2015	market Day	1104	193	105	1402
		19.04.2015	Non-working Day	643	154	127	924
3	MINES MAIN GATE	30.03.2015	Working Day	576	177	350	1103
		18.04.2015	market Day	631	231	230	1092
		19.04.2015	Non-working Day	245	58	27	330

Figure-3: Graph showing traffic density monitoring





- 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 quality is being monitored in six locations of core and buffer zone of the lease area. The air samples are also being analysed for the free silica content. The analysis report of the same is given in the **Table-5 & 6**.

[Table- 5: Mineralogical Composition in Ambient Air Quality]

MINERALOGICAL COMPOSITION IN AMBIENT AIR QUALITY							
April-September 2015							
M/s BALASORE ALLOYS LIMITED							
KALIAPANI CHROMITE MINES							
Monitoring Stations	Station Code	Range	PM10 (Micro Gram/ CuM)	PM 2.5 (Micro Gram/ CuM)	Pb(Micro Gram/Cu M)	Ni(Micro Gram/ CuM)	As (ng Gram/ CuM)
Rooftop of Administrative Building (Core Zone) Elevation-123M N21002'47" E85045'14.2"	AAQ-1	AVERAGE	62.2	25.2	0.00023	BDL	BDL
Rooftop of Bachelor Barrack Elevation-127M N21002'5.7" E85045'34.2"	AAQ-2	AVERAGE	63.3	24.4	0.00024	BDL	BDL
Open cast quarry (Core Zone) Elevation-155M N21° 01' 57.8" E85° 46' 01.2"	AAQ-3	AVERAGE	67.4	25.4	0.00021	BDL	BDL
Village Kaliapani (Buffer Zone) Elevation-122M N21° 03' 42.0" E85° 46' 19.3"	AAQ-4	AVERAGE	61.0	21.9	0.00025	BDL	BDL
Village Ransol (Buffer Zone) Elevation-113M N21° 03' 43.1" E85° 44' 32.2"	AAQ-5	AVERAGE	55.1	19.5	0.0002	BDL	BDL
Village Sukrangi (Buffer Zone) Elevation-153M N21° 02' 44.5" E85° 48' 16.3"	AAQ-6	AVERAGE	60.6	23.4	0.00025	BDL	BDL

[Table- 6: Free silica content in Ambient Air Quality]

Analysis result of Free Silica				
M/s BALASORE ALLOYS LIMITED				
KALIAPANI CHROMITE MINES				
Sl. No	Monitoring Location	Station Code	PM10 (Microgram/M3)	Free Silica in PM10(%)
1	Office Area	A1	71.000	3.9
2	Bachelor Barrack	A2	76.0	4.2
3	Quarry	A3	86.000	4.4
4	Kaliapani Village	A4	78.0	3.2
5	Ransol Village	A5	63.0	2.9
6	Sukrangi Village	A6	82.0	3.5

- 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. Water sprinkling has been going on through two nos. Of water tankers (12 KL capacity each) at loading and unloading points including transfer points regularly to control the generation of dust. Fixed sprinklers also installed at COB plant area for controlling of dust generation.

PHOTO-4 : SHOWING COB PLANT

PHOTO-5 : SHOWING FIXED SPRINKLER IN OPERATION



PHOTO-6 : SHOWING MOBILE SPRINKLER ON OPERATION



- 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 April 2015 to September 2015 is given in **Table-7**.

[Table-7: Ambient air quality for the period Apr'2015 to September 2015]

AMBIENT AIR QUALITY FOR THE PERIOD APRIL-SEPTEMBER 2015											
M/s BALASORE ALLOYS LIMITED											
KALIAPANI CHROMITE MINES											
Sl. 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)
					PM 10	PM 2.5	SO ₂	NO _x			
1	Rooftop of Administrative Building (Core Zone) Elevation-123M N21002'47 " E85045'14 .2"	AA Q-1	April-15	AVERAGE	80.7	38.1	7.9	15.2	0.3	7.2	BDL
				MAX. VALUE	90.0	46.0	9.4	18.2	0.4	7.8	BDL
				MIN.VALUE	69.0	28.0	6.3	11.3	0.2	6.6	BDL
			May-15	AVERAGE	70.2	29.1	7.6	11.9	0.3	7.0	BDL
				MAX. VALUE	80.0	36.0	9.6	13.4	0.4	7.5	BDL
				MIN.VALUE	58.0	20.0	5.8	9.9	0.2	6.5	BDL
			June-15	AVERAGE	59.0	21.3	6.6	11.2	0.3	7.1	BDL
				MAX. VALUE	77.0	32.0	9.6	12.9	0.4	7.5	BDL
				MIN.VALUE	40.0	10.0	4.3	9.9	0.2	6.8	BDL
			July-15	AVERAGE	56.9	18.6	6.6	10.5	0.3	6.775	BDL
				MAX. VALUE	71.0	27.0	8.0	11.2	0.4	7.1	BDL
				MIN.VALUE	40.0	10.0	4.8	9.2	0.2	6.5	BDL
			August-15	AVERAGE	45.5	18.0	6.2	11.8	0.2	BDL	BDL
				MAX. VALUE	51.0	24.0	7.2	11.8	0.2	BDL	BDL
				MIN.VALUE	40.0	12.0	5.1	11.8	0.2	BDL	BDL
			September-15	AVERAGE	61.0	26.0	6.6	11.6	0.3	6.75	BDL
				MAX. VALUE	66.0	30.0	7.4	12.7	0.4	6.9	BDL
				MIN.VALUE	56.0	22.0	5.9	10.1	0.2	6.6	BDL
2	Rooftop of Bachelor Barrack Elevation-127M N21002'5. 7" E85045'34 .2"	AA Q-2	April-15	AVERAGE	81.1	35.1	7.8	14.8	0.3	7.7	BDL
				MAX. VALUE	88.0	40.0	8.9	16.9	0.4	8.7	BDL
				MIN.VALUE	70.0	30.0	6.4	11.9	0.2	6.8	BDL
			May-15	AVERAGE	75.2	27.4	7.4	12.7	0.3	7.1	BDL
				MAX. VALUE	84.0	38.0	8.8	14.6	0.4	7.5	BDL
				MIN.VALUE	65.0	17.0	5.9	10.2	0.2	6.5	BDL
			June-	AVERAGE	59.1	21.4	6.5	12.8	0.3	7.1	BDL



3	Open cast quarry (Core Zone) Elevation-155M N21° 01' 57.8" E85° 46' 01.2"	AA Q-3	15	MAX. VALUE	80.0	32.0	8.8	14.8	0.4	7.5	BDL			
				MIN.VALUE	39.0	10.0	4.9	10.2	0.2	6.5	BDL			
				AVERAGE	54.6	18.4	6.9	11.5	0.3	6.6	BDL			
			July-15	MAX. VALUE	74.0	26.0	8.2	13.5	0.4	7.2	BDL			
				MIN.VALUE	35.0	10.0	4.4	9.2	0.2	5.8	BDL			
			August-15	AVERAGE	41.5	15.5	5.1	BDL	0.2	BDL	BDL			
				MAX. VALUE	48.0	17.0	5.1	BDL	0.2	BDL	BDL			
				MIN.VALUE	35.0	14.0	5.1	BDL	0.2	BDL	BDL			
			September-15	AVERAGE	68.0	28.3	6.7	13.7	0.3	7.133 333	BDL			
				MAX. VALUE	75.0	32.0	7.7	14.5	0.4	7.4	BDL			
				MIN.VALUE	62.0	25.0	6.0	12.9	0.2	6.8	BDL			
			4	Village Kaliapani (Buffer Zone) Elevation-122M N21° 03' 42.0" E85° 46' 19.3"	AA Q-4	April-15	AVERAGE	86.2	41.1	8.2	15.5	0.3	7.5	BDL
							MAX. VALUE	93.0	47.0	9.9	17.2	0.4	8.8	BDL
							MIN.VALUE	79.0	34.0	7.2	13.4	0.2	6.6	BDL
						May-15	AVERAGE	72.9	23.7	7.2	12.6	0.3	7.0	BDL
MAX. VALUE	84.0	34.0					8.3	14.6	0.4	7.5	BDL			
MIN.VALUE	60.0	14.0					5.4	10	0.2	6.5	BDL			
June-15	AVERAGE	61.6				21.8	6.5	11.6	0.3	7.0	BDL			
	MAX. VALUE	82.0				32.0	8.4	14.5	0.4	7.5	BDL			
	MIN.VALUE	42.0				10.0	4.2	9.8	0.2	6.8	BDL			
July-15	AVERAGE	56.4				19.6	6.4	11.3	0.3	6.9	BDL			
	MAX. VALUE	78.0				29.0	8.6	13.9	0.4	7.4	BDL			
	MIN.VALUE	38.0				10.0	4.2	9.2	0.2	6.5	BDL			
August-15	AVERAGE	55.5				19.5	7.2	11.4	0.3	7.2	BDL			
	MAX. VALUE	63.0				24.0	7.2	13.1	0.4	7.2	BDL			
	MIN.VALUE	48.0				15.0	7.2	9.6	0.2	7.2	BDL			
September-15	AVERAGE	72.0				26.7	5.8	13.0	0.3	7.25	BDL			
	MAX. VALUE	78.0				31.0	6.5	13.9	0.4	7.4	BDL			
	MIN.VALUE	65.0				20.0	5.1	11.8	0.2	7.1	BDL			
4	Village Kaliapani (Buffer Zone) Elevation-122M N21° 03' 42.0" E85° 46' 19.3"	AA Q-4	April-15	AVERAGE	78.1	35.0	7.1	14.1	0.3	7.2	BDL			
				MAX. VALUE	88.0	43.0	8.6	16.8	0.4	8.4	BDL			
				MIN.VALUE	70.0	29.0	5.9	11.8	0.2	6.4	BDL			
			May-15	AVERAGE	68.6	21.2	6.4	11.2	0.3	6.9	BDL			
				MAX. VALUE	81.0	30.0	8.2	14	0.4	7.4	BDL			
				MIN.VALUE	60.0	14.0	5.4	9.2	0.2	6.5	BDL			
June-	AVERAGE	60.0	20.5	6.7	12.8	0.3	7.1	BDL						



			15	MAX. VALUE	74.0	29.0	8.6	13.9	0.4	7.4	BDL			
				MIN.VALUE	42.0	12.0	4.7	10.6	0.2	6.8	BDL			
				AVERAGE	55.6	19.1	6.1	11.9	0.3	6.82	BDL			
				July-15	MAX. VALUE	70.0	27.0	7.8	13.1	0.4	7.3	BDL		
					MIN.VALUE	38.0	12.0	4.1	9.6	0.2	6.5	BDL		
					AVERAGE	49.0	18.0	5.7	10.7	BDL	6.9	BDL		
			August-15	MAX. VALUE	53.0	20.0	5.7	10.7	0.0	7	BDL			
				MIN.VALUE	45.0	16.0	5.7	10.7	0.0	6.8	BDL			
				AVERAGE	54.7	17.3	5.9	10.3	0.3	7.2	BDL			
			September-15	MAX. VALUE	62.0	22.0	6.8	12.0	0.3	7.2	BDL			
				MIN.VALUE	45.0	12.0	4.8	9.2	0.2	7.2	BDL			
				AVERAGE	73.4	36.0	6.9	13.2	0.3	6.97	BDL			
5	Village Ransol (Buffer Zone) Elevation-113M N21° 03' 43.1" E85° 44' 32.2"	AA Q-5	April-15	MAX. VALUE	80.0	41.0	7.8	14.9	0.4	7.7	BDL			
				MIN.VALUE	69.0	32.0	5.8	11.8	0.2	6.4	BDL			
				AVERAGE	64.4	19.6	6.6	10.7	0.2	6.8	BDL			
			May-15	MAX. VALUE	72.0	28.0	8.2	13.4	0.3	7.2	BDL			
				MIN.VALUE	58.0	13.0	4.9	9.2	0.2	6.4	BDL			
				AVERAGE	54.3	18.6	6.2	11.1	0.3	6.9	BDL			
			June-15	MAX. VALUE	69.0	27.0	7.4	12.8	0.4	7.1	BDL			
				MIN.VALUE	40.0	12.0	5.4	9.4	0.3	6.4	BDL			
				AVERAGE	50.0	17.1	5.9	10.1	0.3	6.2	BDL			
			July-15	MAX. VALUE	62.0	22.0	6.8	10.8	0.3	6.5	BDL			
				MIN.VALUE	38.0	13.0	5.1	9.5	0.2	5.8	BDL			
				AVERAGE	40.0	12.5	BDL	9.4	BDL	BDL	BDL			
			August-15	MAX. VALUE	43.0	15.0	BDL	9.4	BDL	BDL	BDL			
				MIN.VALUE	37.0	10.0	BDL	9.4	BDL	BDL	BDL			
				AVERAGE	48.3	13.0	5.0	10.3	0.2	6.7	BDL			
			September-15	MAX. VALUE	54.0	16.0	5.3	10.6	0.2	6.7	BDL			
				MIN.VALUE	42.0	10.0	4.7	9.9	0.2	6.7	BDL			
				AVERAGE	84.0	41.1	7.5	15.0	0.3	7.5	BDL			
			6	Village Sukrangi (Buffer Zone) Elevation-153M N21° 02' 44.5" E85° 48' 16.3"	AA Q-6	April-15	MAX. VALUE	92.0	47.0	8.6	17.2	0.4	8.4	BDL
							MIN.VALUE	75.0	35.0	5.8	11.6	0.2	6.6	BDL
							AVERAGE	73.6	27.1	7.5	12.8	0.4	7.0	BDL
						May-15	MAX. VALUE	81.0	34.0	9.6	14.5	0.4	7.5	BDL
							MIN.VALUE	64.0	20.0	5.8	9.8	0.3	6.5	BDL
							AVERAGE	57.6	19.5	6.6	11.9	0.3	7.1	BDL
June-	AVERAGE	57.6				19.5	6.6	11.9	0.3	7.1	BDL			



			15	MAX. VALUE	76.0	28.0	8.6	14.2	0.4	7.5	BDL			
				MIN.VALUE	44.0	10.0	4.5	10.3	0.2	6.5	BDL			
			July-15	AVERAGE	52.1	17.4	6.0	10.9	0.2	6.64	BDL			
				MAX. VALUE	70.0	28.0	7.5	13.2	0.3	7	BDL			
			August-15	MIN.VALUE	39.0	11.0	4.0	9.5	0.2	6.2	BDL			
				AVERAGE	49.5	17.0	4.8	9.8	BDL	6.5	BDL			
				MAX. VALUE	55.0	21.0	4.8	10.3	BDL	6.5	BDL			
			September-15	MIN.VALUE	44.0	13.0	4.8	9.2	BDL	6.5	BDL			
				AVERAGE	46.7	18.3	5.1	11.2	0.3	7.1	BDL			
				MAX. VALUE	52.0	22.0	5.9	12.1	0.4	7.4	BDL			
							MIN.VALUE	41.0	15.0	4.3	10.5	0.2	6.9	BDL
			NORMS(ANNUAL)					60.0	40.0	50.0	40.0	4(1Hr)	180(1 Hr)	100.0
NORMS(24HOURS)					100.0	60.0	80.0	80.0	2.0	100(8 Hr)	400.0			

- 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. The photo of the same is shown as **Photo: 7.**

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 has been monitored regularly installing piezometers at core and buffer zone. Ground water quality has been carried out at six different locations in the core zone and buffer zone. The periodic monitoring [(four times in a year- pre-monsoon (April- May), monsoon (August), post-monsoon (November) and winter (January); once in each season)] has been carried out in consultation with the State Ground Water Board/Central Ground Water Authority and the data thus collected is being 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. One piezometric is installed at Vimtanger village to measure the ground water level at buffer zone of mine, and Report of Ground water level and quality are given in **Table-8,9 & 10** respectively.

However monitoring report reveals that there is no significant impact on ground water table due to mining activity.

[Table-8: Ground water level in buffer zone]

Ground Water Level report (April-September 2015)							
M/S Balasore Alloys Ltd							
Kaliapani Chromite mines							
Village	Well No.	Water Table	Water Table	Water Table	Water Table	Water Table	Water Table
		(MBGL)	(MBGL)	(MBGL)	(MBGL)	(MBGL)	(MBGL)
	Period	April-15	May-15	June-15	July-15	August-15	September-15
Buffer Zone							
kaliapani-1	1	3.7	3.9	3.8	3.5	3.1	3
kaliapani-2	2	4.1	4.4	4.5	4.3	4.2	4.1
Tisco Hutting	3	6.4	6.8	6.4	6	5.4	5.2
Sukrangi	5	3.8	4	3.9	3.1	2.7	2.4

[Table-9: Ground water level in core zone]

**Piezometer reading for the period Apr'2015 to Sep'2015****Kaliapani Chromite Mines, M/s Balasore Alloys Ltd.****FOR THE MONTH OF APRIL 2015**

Bore hole no	Date	Bh Depth (M)	Initial reading (HZ 2)	Present Reading (HZ 2)	Gauge Factor	Water pressure (in KSC)
3(east DG side)	02.04.2015	31.85	8518.9	7729.5	0.003098	2.4455612
1(soth west corner)	02.04.2015	37.53	9354.7	6419.7	0.008809	25.854415
6(north east corner)	02.04.2015	50.6	8750.8	7364.8	0.003042	4.216212
5(north)	02.04.2015	43.09	8931.5	7581.3	0.002673	3.6090846

FOR THE MONTH OF MAY -2015

3(east DG side)	06.05.2015	31.85	8518.9	7548.3	0.003098	3.0069188
1(soth west corner)	06.05.2015	37.53	9354.7	6487.3	0.008809	25.2589266
6(north east corner)	06.05.2015	50.6	8750.8	7129.8	0.003042	4.931082
5(north)	06.05.2015	43.09	8931.5	3451.3	0.002673	14.6485746

FOR THE MONTH OF JUNE-2015

3(east DG side)	03.06.2015	31.85	8518.9	.....	0.003098	Sensor Damage
1(soth west corner)	03.06.2015	37.53	9354.7	6259.7	0.008809	27.263855
6(north east corner)	03.06.2015	50.6	8750.8	.....	0.003042	Sensor Damage
5(north)	03.06.2015	43.09	8931.5	3506.9	0.002673	14.4999558

FOR THE MONTH OF JULY-2015

3(east DG side)	03.07.2015	31.85	8518.9	.....	0.003098	Sensor Damage
1(soth west corner)	03.07.2015	37.53	9354.7	6269.6	0.008809	27.1766459
6(north east corner)	03.07.2015	50.6	8750.8	.....	0.003042	Sensor Damage
5(north)	03.07.2015	43.09	8931.5	3576.9	0.002673	14.3128458

FOR THE MONTH OF AUGUST-2015

3(east DG side)	04.08.2015	31.85	8518.9	.....	0.003098	Sensor Damage
1(soth west corner)	04.08.2015	37.53	9354.7	6490.6	0.008809	25.2298569
6(north east corner)	04.08.2015	50.6	8750.8	.....	0.003042	Sensor Damage
5(north)	04.08.2015	43.09	8931.5	3620.5	0.002673	14.196303



[Table-10: Ground water Quality Analysis Result]

M/s BALASORE ALLOYS LTD									
Kaliapani Chromite Mines									
GROUND WATER QUALITY									
Period- PRE MONSOON (APRIL 2015)									
Date of Sampling- 23.04.2015									
Sl No.	PARAMETERS	Unit	STANDARDS	Results of Pre Monsoon period					
			(IS:10500)						
			GW1	GW2	GW3	GW4	GW5	GW6	
1	pH	....	6.5-8.5	7.42	6.98	7.08	7.62	7.63	7.25
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)	4.0	5.0	3.0	3.0	4.0	5.0
6	Chloride (as Cl)	mg/l	250(Max)	10.4	9.9	9.8	8.9	11.7	10.2
7	Residual Free Chlorine	mg/l	0.2(Min)	ND	ND	ND	ND	ND	ND
8	Total Dissolved Solids	mg/l	500(Max)	138	110	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)	9.40	8.80	9.60	7.80	8.90	7.90
13	Sulphates(as SO ₄)	mg/l	200(Max)	15.70	16.80	14.90	13.80	12.60	12.80
14	Manganese(as Mn)	mg/l	0.1(Max)	BDL	BDL	BDL	BDL	BDL	BDL
15	Nitrate(as NO ₃)	mg/l	45(Max)	0.70	0.59	0.55	0.62	0.58	0.68
16	Alkalinity as CaCO ₃	mg/l	200(Max)	29	40	24	31	35	28
17	Chromium(as Cr+6)	mg/l	0.05	0.018	0.030	0.016	0.010	0.038	0.022
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

M/s BALASORE ALLOYS LTD**Kaliapani Chromite Mines****GROUND WATER QUALITY****Period- MONSOON (AUGUST 2015)****Date of Sampling- 17.08.2015**

Sl No.	PARAMETERS	Unit	STANDARDS	Results of Monsoon period					
			(IS:10500)						
				GW1	GW2	GW3	GW4	GW5	GW6
1	pH	....	6.5-8.5	7.14	7.09	7.32	7.58	7.70	7.29
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)	6.0	9.0	6.0	8.0	10.0	4.0
6	Chloride (as Cl)	mg/l	250(Max)	11.6	10.8	12.1	9.6	12.8	13.4
7	Residual Free Chlorine	mg/l	0.2(Min)	ND	ND	ND	ND	ND	ND
8	Total Dissolved Solids	mg/l	500(Max)	154	130	189	194	141	136
9	Total Hardness	mg/l	300(Max)	75	66	69	72	62	60
10	Iron as Fe	mg/l	0.3(Max)	0.22	0.26	0.20	0.30	0.28	0.32
11	Calcium(as Ca)	mg/l	75(Max)	15.6	14.8	14.1	13.5	12.9	11.8
12	Magnesium(as Mg)	mg/l	30(Max)	9.8	9.2	9.9	8.2	9.40	8.40
13	Sulphates(as SO ₄)	mg/l	200(Max)	15.9	17.2	15.6	14.5	12.90	13.70
14	Manganese(as Mn)	mg/l	0.1(Max)	BDL	BDL	BDL	BDL	BDL	BDL
15	Nitrate(as NO ₃)	mg/l	45(Max)	0.76	0.62	0.58	0.64	0.60	0.70
16	Alkalinity as CaCO ₃	mg/l	200(Max)	31	44	28	36	38	32
17	Chromium(as Cr+6)	mg/l	0.05	0.024	0.030	0.032	0.026	0.042	0.028
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)	0.18	0.18	0.29	0.24	0.28	0.30
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	....	0.71	0.65	0.68	0.60	0.66	0.70

STATION	CODE
TISCO CAMP	GW-1
VILLAGE KALIAPANI	GW-2
VILLAGE SUKRANGI	GW-3
INSIDE MINES	GW-4
VILLAGE CHINGUDIAPAL	GW-5
VILLAGE KALRANGI	GW-6

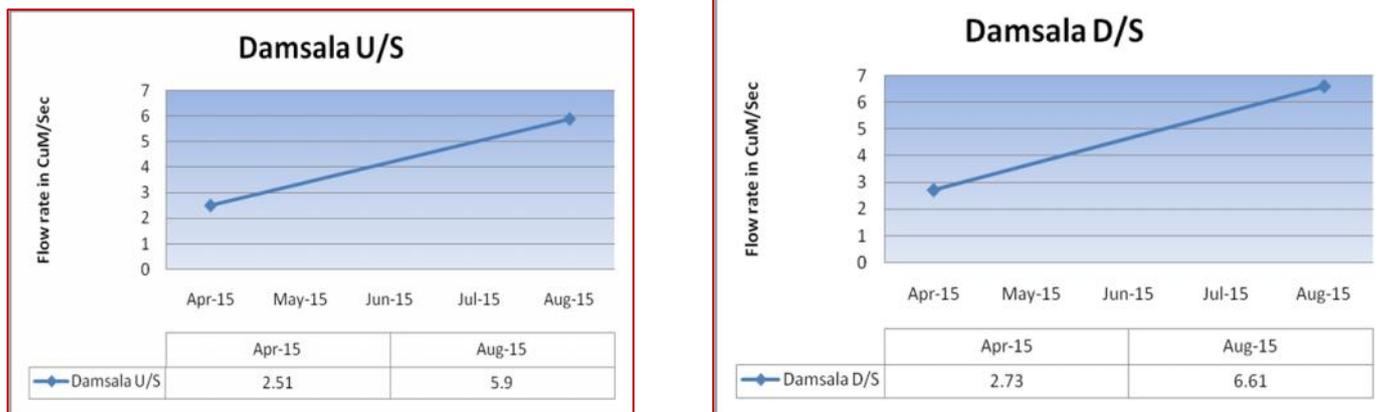
- xiii. The project proponent shall regularly monitor the flow rate of the natural water streams flowing adjacent to the mine lease and maintain the records.

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 pre-monsoon (April'2015) and Post-Monsoon (August'2015) season is given in the **Table-11**.

[Table-11: 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					
Sl No	Location	Co-ordinate of the location	Month of Monitoring	Flow rate m ³ /s	Flow rate IN CUSEC
1	Damsala U/S	21 ⁰ 02'35.9"N 85 ⁰ 45'27.01"E	April'2015	2.51	88.80
2	Damsala D/S	21 ⁰ 02'10.47"N 85 ⁰ 44'31.92"E		2.73	96.51
3	Damsala U/S	21 ⁰ 02'35.9"N 85 ⁰ 45'27.01"E	August'2015	5.90	208.91
4	Damsala D/S	21 ⁰ 02'10.47"N 85 ⁰ 44'31.92"E		6.61	233.38

Figure-7: Graph showing Flow rate of Damsala nallah at up-stream & down-stream



- 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 33100 Sqm area of dump slope has been covered by Geotextile and 10200 Sqm area covered with grass turffing. Year wise afforestation has been undertaken. The details of the same is given in **Table- 12 & 13.**

Photo of Plantation, coirmatting and 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.

[Table- 12: Details of Coir matting and grass turffing on dump slope]

**DETAILS OF COIR MATTING & GRASS TURFFING ON DUMP SLOPE
KALIAPANI CHROMITE MINES, M/s BALASORE ALLOYS LIMITED**

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)	2000
Total		33100
DETAILS OF GRASS TURFFING		
YEAR	LOCATION	AREA (SQM)
2013-14	Dump-1 (Access road) slope	5000
2014-15	Dump-1 (Access road) slope	5200
Total		10200



[Table-13: 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	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	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 point (Dump-1)	1.25	5000	98%	Peltophorum, Acacia, Albizzia, Bouganvillea, Simarouba, Gliricidia and Arjun



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
TOTAL		75790		



INSIDE ML AREA

PHOTO-9: SHOWING COIR MATTING OVER DUMP SLOPE

PHOTO-8: SHOWING PLANTATION



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- 14, 15 & 16**. Photo of the same is attached as **Photo- 9 to 16**.

[Table- 14: Environmental management measures of Dump-1]

Environmental Measures	Present Quantity
Retaining wall(gabion wall)	301M×14m×7M
Garland drain	224 M
Coirmatting	8500 Cum
Plantation	36190 nos
Grass Turffing	10200 Cum
Settling Pit	Two nos 90 Cum & 192 Cum

Photo 11 & 12: Dump Management Activities of Dump-1



[Table- 15: Environmental management measures of Dump-2]

Environmental Measures	Present Quantity
Retaining wall(gabion wall)	116M×2m×1M
Garland drain	116 M
Coirmatting	5000 Cum
Plantation	12000 nos
Settling Pond	Run-off directly goes into mine pit

Photo 13 & 14: Dump Management Activities of Dump-2



[Table- 16: Environmental management measures of Dump-3]

Environmental Measures	Present Quantity
Retaining wall	380M×1M×2M, 150M×1M×5M
Garland drain	830 M
Coirmatting	8500 Cum
Plantation	11750 nos
Settling Pit	Two nos 972 Cum & 288 Cum

Photo 15 & 16: Dump Management Activities of 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- 13**. The density of trees planted is around 4166 No./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. An area of 23.20 Ha is anticipated to be excavated at the conceptual stage, the same will be converted into water body.

- 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 April 2015 to September 2015 is given in **Table-7**.

- 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-1**.

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(July'2015-September'2015) given in **Table-3**. The surface run-off management photos and layout is given in **Photo-3 & Figure-2**.

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.

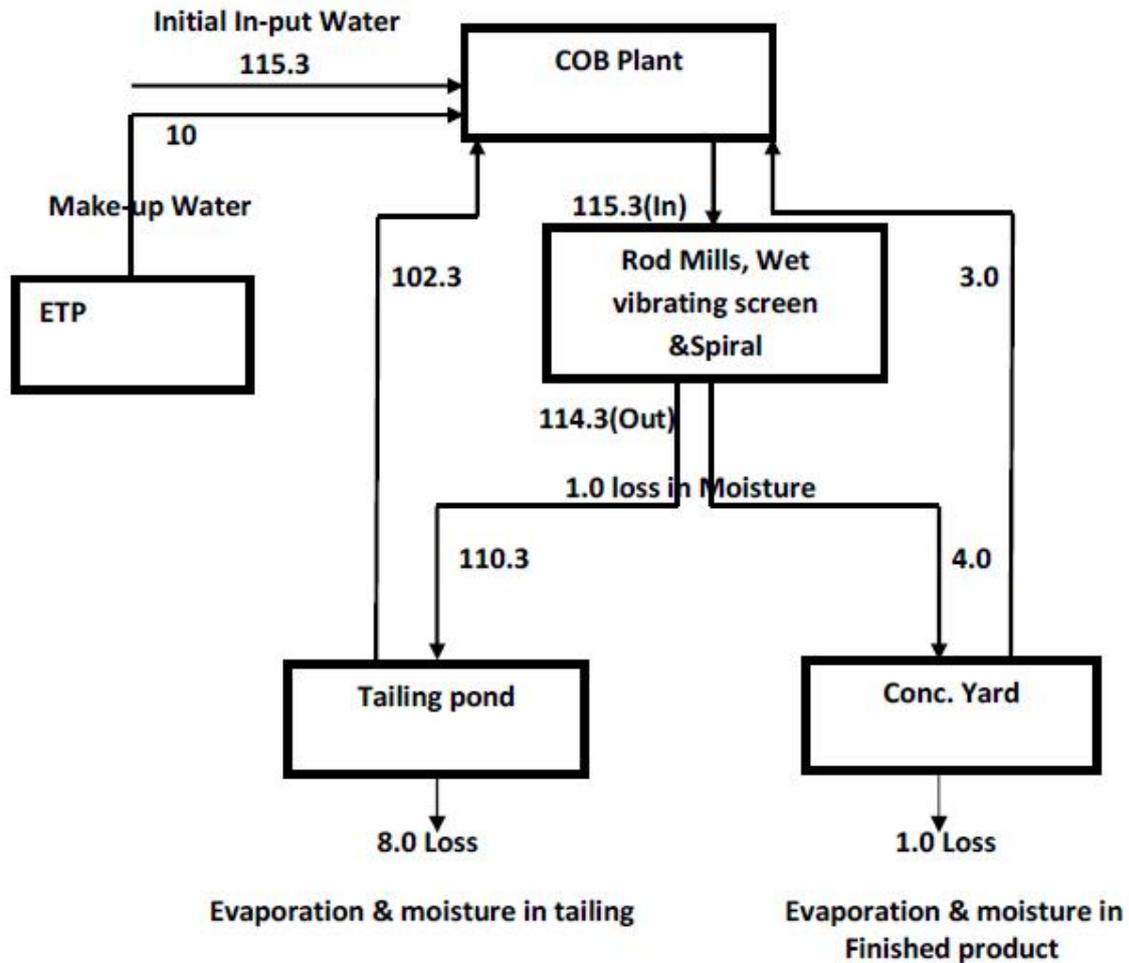


Figure-5: COB Plant Water Balance

- 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 pre-monsoon (April,2015) and monsoon (August'2015) season is given in the Table-11.

- 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 and record of monitoring data is 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. The analysis report of the same is given in **Table-17**.

[Table- 17: Surface water analysis result]

SURFACE WATER QUALITY						
Period-PRE-MONSOON (APRIL 2015)						
Kaliapani Chromite Mines						
M/s BALASORE ALLOYS LTD						
Date of Sampling: 23.04.2015						
Sl No.	PARAMETERS	Unit	STANDARDS	Results of Winter period - 2014-15		
			(IS:2296 CLASS C)	SW1	SW2	SW3
1	Colour	Hazen	300	Colourless	Colourless	Colourless
2	pH	....	6.5-8.5	7.59	7.14	7.5
3	Iron as Fe	mg/l	50	0.4	0.51	0.44
4	Chloride (as Cl)	mg/l	600	14.9	15.08	14.4
5	Fluoride as F	mg/l	1.5	0.09	0.07	0.1
6	Total Dissolved Solids	mg/l	1500	150	139	155
7	Total Suspended Solids	mg/l	.....	50	60	44
8	Manganese(as Mn)	mg/l	.....	0.049	0.042	0.05
9	Sulphates(as SO ₄)	mg/l	400	14.9	15.2	13.9
10	Nitrate(as NO ₃)	mg/l	50	0.49	0.4	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	0.032	0.36



15	Total Chromium	mg/l	.....	0.52	0.54	0.56
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	.....	0.34	0.38	0.26
22	Oil & Grease	mg/l	0.1	ND	ND	ND
23	Free Ammonia (NH ₃)	mg/l	.....	0.12	0.1	0.13
24	Coliform Organism	MPN/100ml	5000	189	177	199
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	6.2	6.4	5.8
27	BOD, 3 days at 27°C	mg/l	3	2.2	2.4	1.9
28	COD	mg/l	.....	6.2	6	5.8
29	Electrical Conductivity	µmhos/ms	.....	124	116	118
30	Phosphorous as P	mg/l	.....	0.3	0.34	0.36



SURFACE WATER QUALITY						
Period-MONSOON (AUGUST 2015)						
Kaliapani Chromite Mines						
M/s BALASORE ALLOYS LTD						
Date of Sampling: 17.08.2015						
SI No.	PARAMETERS	Unit	STANDARDS	Results of monsoon period - 2015-16		
			(IS:2296 CLASS C)	SW1	SW2	SW3
1	Colour	Hazen	300	Colourless	Colourless	Colourless
2	pH	....	6.5-8.5	7.62	7.21	7.58
3	Iron as Fe	mg/l	50	0.38	0.61	0.49
4	Chloride (as Cl)	mg/l	600	15.2	14.8	14.9
5	Fluoride as F	mg/l	1.5	0.12	0.11	0.16
6	Total Dissolved Solids	mg/l	1500	167	142	159
7	Total Suspended Solids	mg/l	.....	52	66	48
8	Manganese(as Mn)	mg/l	.....	0.052	0.048	0.055
9	Sulphates(as SO4)	mg/l	400	15.3	15.9	14.6
10	Nitrate(as NO3)	mg/l	50	0.56	0.48	0.5
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	0.042	0.036	0.04
15	Total Chromium	mg/l	.....	0.58	0.59	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	.....	0.38	0.42	0.29
22	Oil & Grease	mg/l	0.1	ND	ND	ND
23	Free Ammonia (NH ₃)	mg/l	.....	0.18	0.2	0.24



24	Coliform Organism	MPN/100ml	5000	224	210	249
25	Bio-Assay Test	.....	90% of survival of fish after 96 hours in 100% effluent	98.00%	97.00%	98.00%
26	Dissolved Oxygen as O ₂	mg/l	4	6.6	6.8	6.4
27	BOD, 3 days at 27°C	mg/l	3	2.8	3.1	2.6
28	COD	mg/l	.....	6.6	6.8	6.4
29	Electrical Conductivity	µmhos/ms	.....	140	128	132
30	Phosphorous as P	mg/l	.....	0.36	0.40	0.44
	STATION	CODE	CO-ORDINATE	RL		
	DAMSALA NALLAH NEAR CHIRIGUNIA U/S	SW1	N21 ⁰ 02'39.1" E85 ⁰ 46'21.4"	102		
	DAMSALA NALLAH NEAR CHINGUDIAPALA D/S	SW2	N21 ⁰ 02'8.8" E85 ⁰ 44'27.8"	84		
	NEAR MINE BOUNDARY DISCHARGE	SW3	N21 ⁰ 02'18.1" E85 ⁰ 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**.

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. Copy of the PUC certificate of truck carrying material is attached as **Annexure-IV** & Vehicular emission report given in **table -18**. Photographs showing vehicles covered with tarpaulin is given as **Photo-17**.

Table:-18: 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- 17: 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 installation of one STP of 40 KLD capacity is on progress.

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.

Oil and Grease trap has been Installed at discharge of workshop effluents which is working efficiently. Photo of same is attached as **Photo-18**.

PHOTO-18: SHOWING VEHICLE SERVICING CENTER WITH OIL & GREASE TRAP

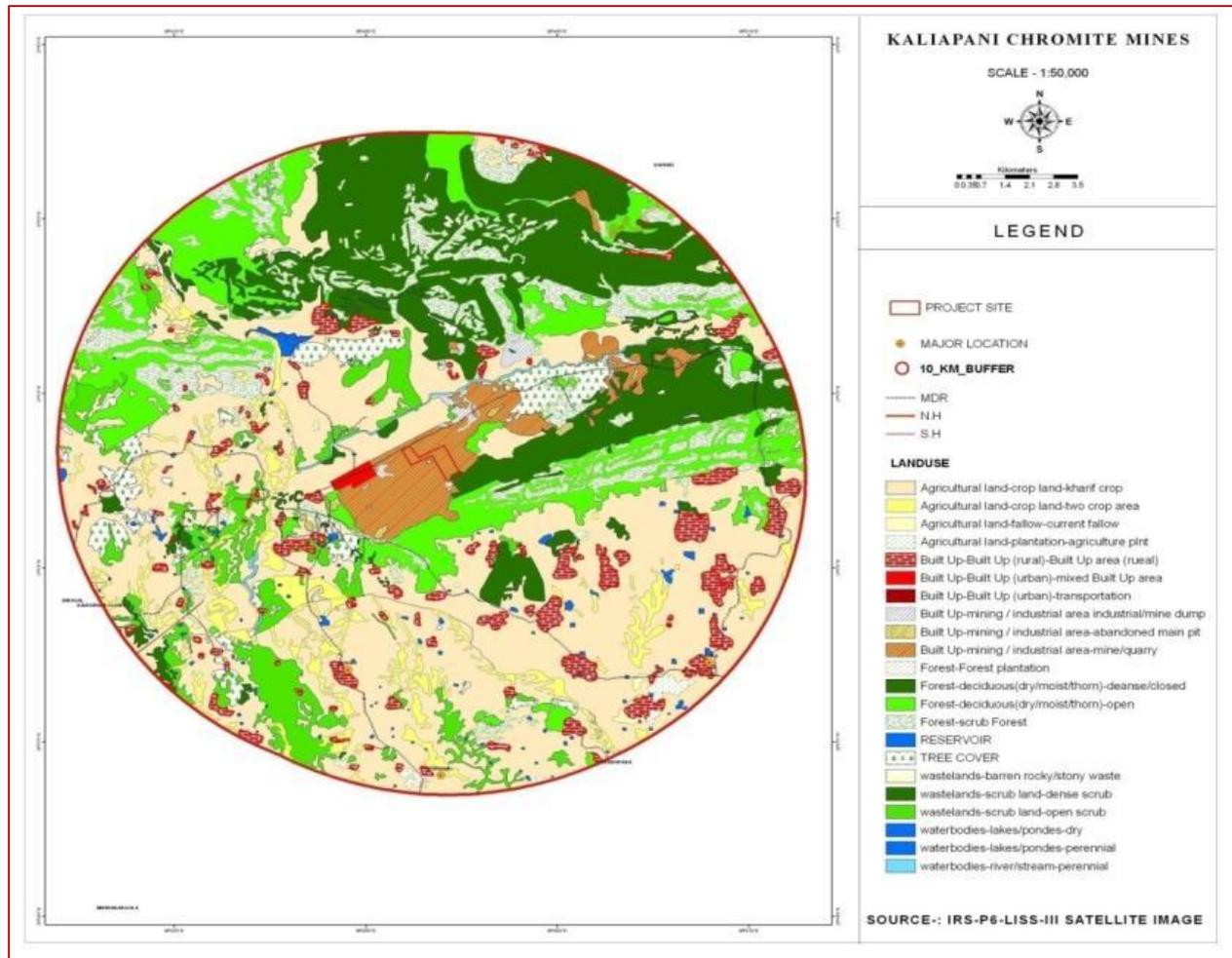


xxiv. Digital processing of the entire lease area using remote sensing technique shall be carried out regularly once in three years for monitoring land use pattern and report submitted to Ministry of Environment and Forests and its Regional Office, Bhubaneswar.

Status- Digital processing of the entire lease area using remote sensing technique shall be carried out once in three years for monitoring land use pattern and report will be submitted to Ministry of Environment and Forests and its Regional Office, Bhubaneswar. However, the satellite image of the study area during the baseline study period is given as **Figure- 6.**

Figure- 6: Showing satellite image of study area during





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. The details of IME & PME is given in **Table- 19**.

[Table-19: Details of IME & PME status]

DETAILS OF IME & PME AS ON 31.09.2015						
KALIAPANI CHROMITE MINES, M/S BALASORE ALLOYS LTD						
SL NO	CATEGORY	MAN POWER	IME EXECUTED	PME EXECUTED	IME TO BE DONE	PME TO BE DONE
1	BAL	212	142	61	9	0
2	DRM	21	21	0	0	0



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 Plan 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- V**.

In addition to that a sum of Rs 12, 89,260 was deposited towards payment for implementation of Regional Wildlife Management Plan.

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. CSR activities taken up during the period of October,2014 to September'2015 given below in **Table-20**. The photos of the same is shown as **photo-19, 20, 21 & 22**.

[Table- 20: CSR DETAILS OF FOR THE PERIOD OCTOBER 2014 TO SEPTEMBER 2015]

Sl. No.	Activity	Amount
1	Installation of 04 nos. Tube well at Ransol, Kaliapani, Chingudipal & Kansa G.Ps.	427000
2	Reimbursement of Elect. Bill for Drinking water Supply Project at Kaliapani & Ghagia Sahi	78016
3	Handing over ceremony of Kaliapani Water Supply Project	50500
4	Installation of 03 nos. Bore well with water vat at Aradapal, Kantabania Harijan Sahi & Majhi Sahi of Chingudipal G.P.	678693
5	Organization of Mega Health Camp at Kaliapani	172642
6	Organization of Mobile Health Services	60000



7	Contribution for Flood Relief to the District Administration, Jajpur	50000
8	Supply of Cattle Feeds to the Flood Affected Area, Sukinda	12900
9	Supply of materials to Chandimata Youth Club, Kaliapani & Samrat Youth Club, Chirigunia	153200
10	Distribution of 100 nos. Coconut trees	25800
11	Development of Adivasi Sports	40000
12	Makara Mela	20000
13	Distribution of gift on Virsha Munda Jayanti	42800
14	Distribution of Blankets & Mosquitos 200 nos. each	103600
15	Installation of Street Lights in Mangalpur-Toka Road	675000
16	White Washing for Pimpudia High School	47000
17	Distribution of 171 nos. School bags among Chandimata M.E.School & Kaliapani U.P.School, Kaliapani	48000
18	Distribution of Cricket Kits among 15 nos local Cricket Teams from 07 G.P.s & sports materials distibuted among SRCKMS, Samrat Club, Chandimata Club members for foot ball & tenis Tournament and Financial assistance for organizing tournaments	289536
19	Conducted Press Meeting of local journalists for updation of CSR activities	12000
20	Water Supply through Gravity at Bamnagar	385253
21	Electrification to the 3 no of Water Supply Project at Chingudipal G.P.	13412
22	Construction of Austaprahari Mandop at Ransol	223986
Total		3609338



Photo-19: Showing distribution of blankets



Photo-20: Showing inauguration of drinking water project



Photo-21: Showing celebration of Birsha jayanti



Photo-22: Showing distribution of saplings





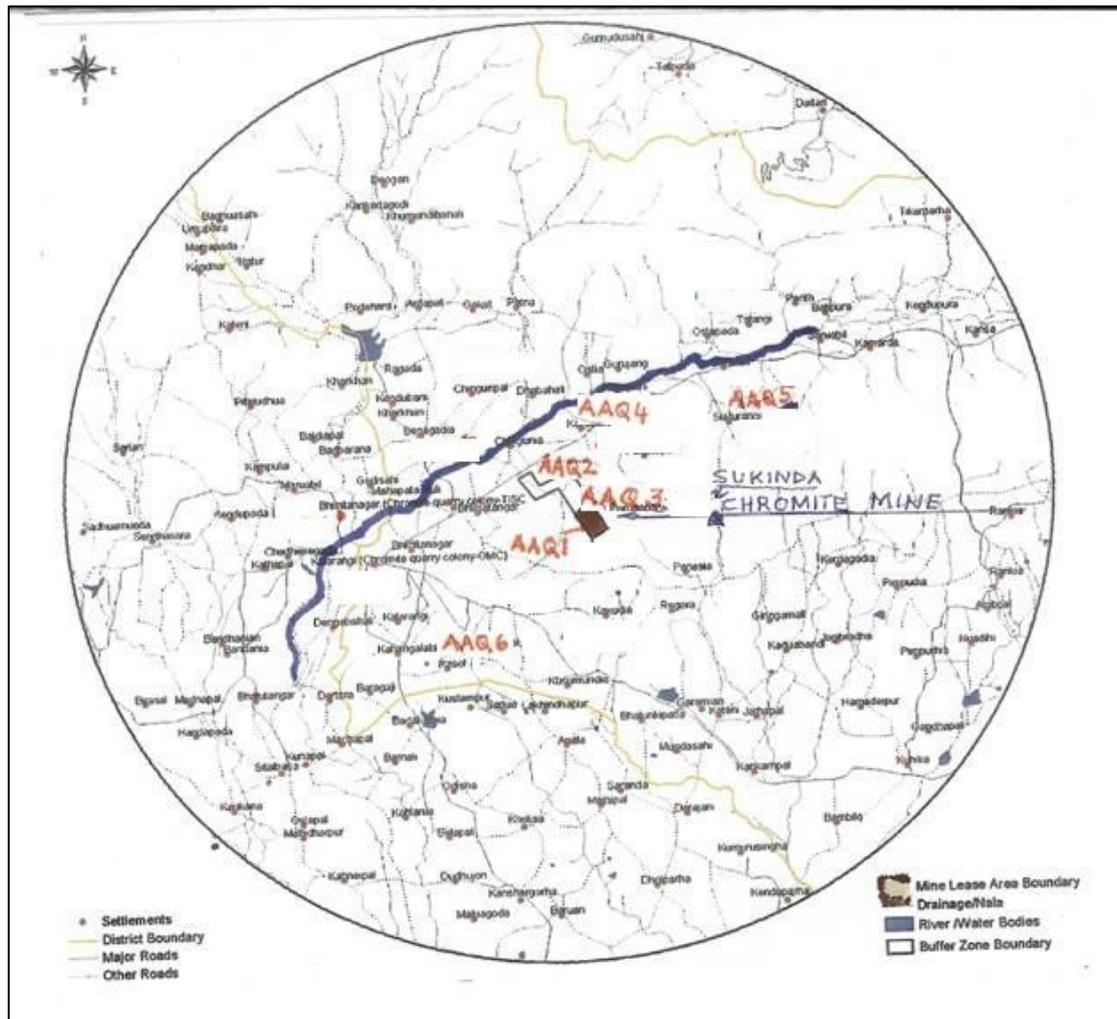
General Conditions & their Status:

- 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, 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'15 to September'15 is given in **Table-7**.

Location showing AAQ monitoring stations shown as **Figure- 7**

Figure-7: Showing location of Ambient Air Quality Monitoring Stations



- 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 21**. Photographs showing use of PPEs are given as **Photo-23**.



Photo-23: SHOWING WORKERS WORKING WITH PPE







[Table- 21: Ambient & Workzone Noise Level Monitoring Report]

Kaliapani Chromite Mines, M/s Balasore Alloys Ltd.
AMBIENT NOISE LEVEL (APRIL TO SEPTEMBER 2015)

Sl.No	Location	Station Code	DAY		NIGHT		DAY		NIGHT		DAY		NIGHT	
			DAY	NIGHT										
Month			Apr-15		May-15		Jun-15		Jul-15		Aug-15		Sep-15	
1	Mines Office	ANL 1	49.1	33.5	48.2	34.2	48.85	31.15	46.3	30.9	47.8	32.8	44.35	30.45
2	Village Kaliapani	ANL 2	46.1	32.8	43.3	30	48.1	34.15	47.3	31.2	42.8	30.9	47.2	32.9
3	Village Sukrangi	ANL 3	50.3	31.4	42.2	30.8	44.9	31.25	47.4	31.9	43	31.1	43.7	30.95
4	Village Ransol	ANL 4	50.2	35.8	47.7	33.7	47.55	31.8	45.8	30.3	46.5	31.6	46.65	31.05
5	Village Tisco Hutting	ANL 6	47.7	34.9	44.5	31.7	46.75	31.5	48.1	32	47.1	32.7	46	34

WORK ZONE NOISE LEVEL

1	O/C Quarry	WNL 1	68.8	62	65	56.55	64.15	59.15	65.2	61.8	62.3	51	65.55	59.8
2	Dumper Operation	WNL 2	67.7	61.4	65	56.55	64.2	62.3	67.2	62.7	66.7	60.8	71.15	63.05
3	Loader Operation	WNL 3	70.6	64.2	69.85	61	65.7	63.45	69.4	63.9	70.8	62.5	71.35	64.3
4	DG Set	WNL 4	71.8	63.8	57.25	64.95	73.05	70.9	72.4	68.9	72	65.3	70.95	65.35
5	Electric Pump	WNL 5	68	63.8	71.65	66.1	.....	.....	66.7	63.9	65.7	61.3	65.05	62.5
6	Loading Point	WNL 6	64.6	56	65.15	55	66.65	62.1	67.7	63.8	67.5	61.1	65.75	63.95
7	COB Plant	WNL 7	66.5	57.4	64.5	54.15	66.6	62.15	67.8	65.3	65.9	60.7	67.55	61.65
8	Drilling Machine	WNL 8	69.4	....	72.6	.....	.....	.....	70.1	....	...	....	....	....



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. The Water balance of the plant is given in **Figure- 5**.

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.

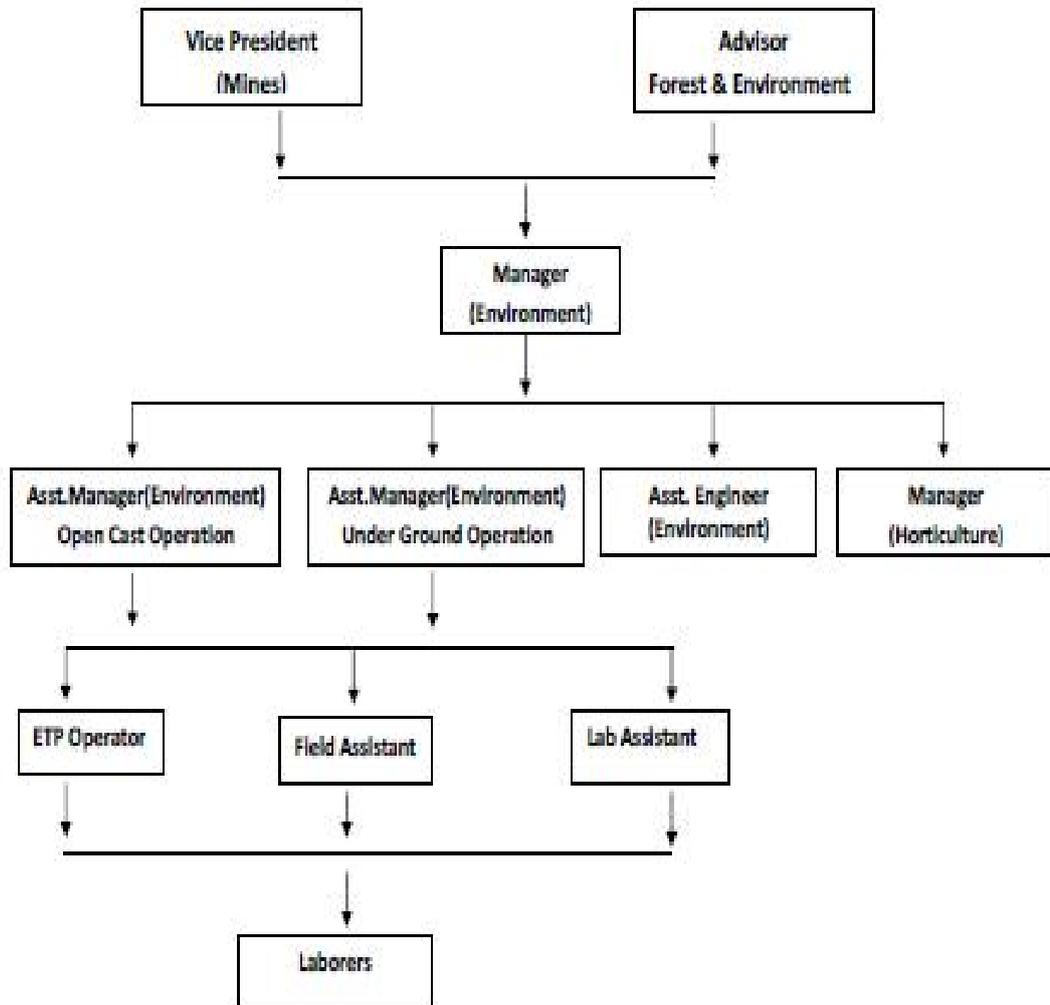
Status- Pre-placement medical examination and periodical medical examination of the workers engaged in the project is being carried out and records maintained for corrective measures.

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 Vice President (Mines) has been set up. Organizational Chart of Environmental Management Cell is given below.



Figure- 8: 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-22**.



Six Monthly Environment Compliance Report
[Table-22: Expenditure on EMP]

Sl. No.	Activity	Expenditure in INR	
		Oct 2014- March- 2015	Apr 2015- Sept 2015
1	Grass turfing with haul road slope plantation	390868	533000
2	Development of Green Belt and afforestation.	212375	2226700
3	Application of coir geo textiles	NIL	810000
4	ETP Operation & Maintenance	1161028.1	1031469
5	Chemicals for existing ETP	224730	630000
6	Environmental equipment purchase	Nil	4300000
7	Environmental Monitoring Equipment Maintenance	11500	12540
8	Environmental monitoring	531368	947262
9	Dust suppression	1,616,848	5,800,000
10	Statutory Payment	107983	480444
11	Fixed type water sprinklers/maintenance	15,000	15000
12	Maintenance of wetting provision in drilling machine.	15,000	15000
13	Construction of settling pit	2600000	NIL
14	Observation of ME & MC week, 2014-15	85620	NIL
Total Amount incurred: in Rs		6972320.1	16801415

- 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.



Six Monthly Environment Compliance Report

- 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-23**.

[Table-23: The status of six monthly EC compliance submissions]

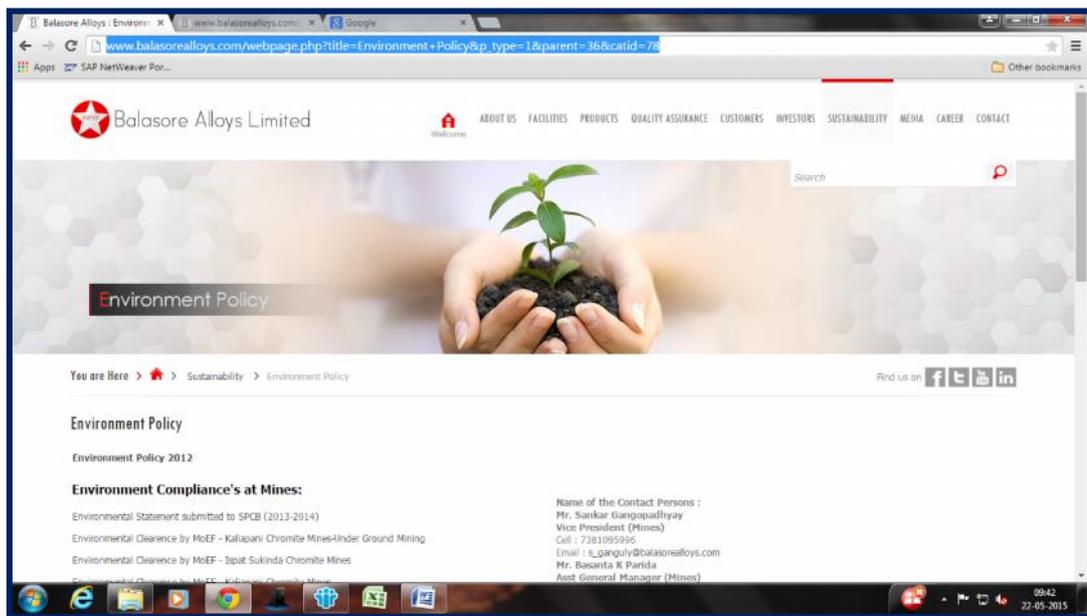
Period	Letter no.	Date of submission
October 2014 to March 2015	BAL/MINES/2376/2015	28.05.2015
April 2014 to September 2014	BAL/MINES/1825/2014	29.11.2014
October 2013 to March 2014	BAL/MINES/161	28.05.2014
April 2013 to September 2013	BAL/MINES/394	30.11.2013
October 2012 to March 2013	BAL/MINES/202	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 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**.

Figure-13: 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.

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.



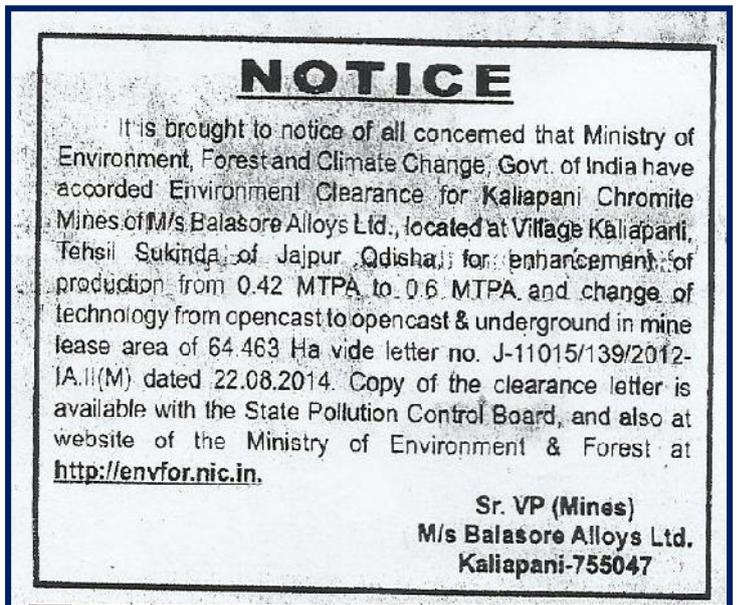
Six Monthly Environment Compliance Report

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**.

- 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.



Copy of Environment clearance letter also forwarded to the Regional Office of this Ministry located at Bhubaneswar and the letter attached as **Annexure- VIII**.



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 Kalipani 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 Kalipani 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



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. 18176/

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: CONSENT TO OPERATE OBTAINED FROM OSPCB



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-2561909, Fax: 2562822, 2560955

CONSSENT ORDER

No. 557 / IND-I-CON- 2576 Dt. 12-01-2015

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. 83616 dated 26.11.2014

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 S. GANGOPADHYAY, VICE PRESIDENT (MINE)

Address: AT/PO: KALIAPANI, DIST: JAJPUR

This consent order is valid for the period up to **31/03/2016**

This consent order supersedes the earlier consent order issued vide letter No. 4395 dated 25.03.2014

Details of Products Manufactured

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

Details of Mineral Handling Plants/Units

01.	Operation of 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.



ANNEXURE-IV: PUC CERTIFICATE

OR09F0616

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 : 2005	Date : 19.NOV. 2015
Vehicle Registration No:OR09F-0616	Time ;08:39:A:M
Spedometer Reading (Kms) : 0	Owner;B.PRADHAN.
Engine Number:0000	Driver :D.
Chasis Number :0000	Fuel : Diesel
Vehicle color :RED	Smk cell Temp : 58.0
Vehicle Make : TATA	Valid Up To : 18-MAY-2016
Vehicle Model :TA-1613	Oil Temp :106.0
Test Station Code:123	Validity:6 Months
Type Of Vehicle : 6W	Grade : A
Test Result : Free Acceleration	

No. of K	Kval	Min Rpm	Max Rpm	Interval	Oil Temp	Test Time
1	0.15	1710	1040	2.8	82.0	09:23
2	0.15	1750	1940	2.8	82.0	09:23
3	0.15	1590	1920	2.8	82.0	09:23
4	0.15	1610	1030	2.8	82.0	09:24
5						
6						
7						
8						
9						
K Avg 0.15						

Subrata Senapati



MAA CHANDI
P.T.C
KALIAPANI

ମା ଚଣ୍ଡୀ
ପ୍ରଦୂଷଣ ନିୟନ୍ତ୍ରଣ
କାଳିଆପାଣି

OK
28/11/15

Certified that this vehicle's K-Mean and HSD% value conforms to the



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, 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. *817571* 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.

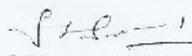
(i) For activities to be implemented in project area by the User Agency in Cuttack Division	₹64.82 lakh
(ii) For activities to be implemented by DFO, Cuttack Division in project impact area	₹189.36 lakh
Grand Total:	₹254.18 lakh

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



-2-

Memo No. 8476 /date 07-11-2014

Copy forwarded to the Divisional Forest Officer, Cuttack Division for information and necessary action with reference to memo No.5063 dt 10.10.2014 of RCCF, Angul Circle.

**Encl: 1 copy of approved
site specific WL Conservation Plan**


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

Memo No. 8477 /date 07-11-2014

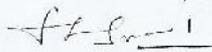
Copy forwarded to the Regional Chief Conservator of Forests, Angul Circle for information and necessary action with reference to his memo No.5062 dt 10.10.2014.


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

Memo No. 8478 /date 07-11-2014

Copy forwarded to M/s Balasore Alloys Ltd., At/PO- Kaliapani, Dist.- Jajpur for information and necessary action.

**Encl: 1 copy of approved
site specific WL Conservation Plan**


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



ANNEXURE-VI: LETTER OF SUBMISSION OF EC COPY TO PANCHAYAT

BALASORE ALLOYS LIMITED



Ref: BAL/Mines/268/2014

Date: 02.09. 2014

To

The Sarpanch,
Kankudapala Grama Panchayat,
Jajpur, Odisha

Subject: Submission of Environmental Clearance Order obtained in respect of Kaliapani Chromite Mine (ML Area – 64.463 Ha.) of M/s. Balasore Alloys. Ltd - for Expansion in Production Capacity from 0.42 MTPA to 0.6 MTPA, Change of technology from Opencast to Underground, Village: Kaliapani, Tehsil: Sukinda, District: Jajpur (Odisha).

Sir,

With reference to the above subject, we herewith submitting the Environmental Clearance order issued Vide letter No. J-11015/139/2012-IA.II (M) Dated: 22nd August, 2014 with reference to our application for obtaining Environment Clearance in respect of Kaliapani Chromite Mine (ML Area – 64.463 Ha.) of M/s. Balasore Alloys. Ltd in Village: Kaliapani, Tehsil: Sukinda, District: Jajpur (Odisha) for expansion in production capacity from 0.42 MTPA to 0.6 MTPA, change of technology from opencast to opencast & underground, Village :Kaliapani, Tehsil: Sukinda, District: Jajpur (Odisha) on 04.05.2012.

This is for your kind information.

Thanking you and with regards

Yours faithfully
For M/s. Balasore Alloys Ltd.

Agent
Kaliapani Chromite Mines
M/s Balasore Alloys Limited

Encl: As above

Kaliapani Chromite Mines, At/Po.: Kaliapani - 755047, Dist.: Jajpur, Odisha, Phone : 06726-268297/98, Fax : 06726-268520

E-mail : sukinda_mines@balasorealloys.com, ialmines@yahoo.com, Website : www.balasorealloys.com

BBSR Office : Module C/1, 1st Floor, Fortune Tower, Chandrasekharpur, BBSR - 23, Odisha, (India), Ph. : 0674-2301358, Fax : 0674 - 2301639

Regd. Office & Works : Balgopalpur-756020, Balasore, Odisha, Phone : 06782-275781 to 85, Fax : 275724

CIN-L27101OR1984PLC001354



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





ANNEXURE-VIII: LETTER SUBMITTED TO REGIONAL OFFICE, MoEF, BBSR FOR THE INFORMATION OF EC GRANT

BALASORE ALLOYS LIMITED



Ref: BAL/Mines/ 1576/2014

Date: 3.9.2014

To,

The Director (s).
Ministry of Environment and Forest,
Eastern Regional Office, A/3, Chandrasekharpur,
Bhubaneswar-751023.

Subject: Environmental Clearance Order in respect of Kaliapani Chromite Mine of M/s Balasore Alloys Ltd., Village Kaliapani, Tehsil Sukinda, District Jajpur, Orissa .(64.463 ha ML Area) for expansion of production capacity from 0.42 MTPA to 0.6 MTPA and change in technology from opencast to opencast and underground. Regarding information about advertisement.

Sir,

With reference to the above subject; we would like to inform you that Environmental Clearance for Kaliapani Chromite Mine (ML Area – 64.463 Ha.) - Expansion in Production Capacity from 0.42 MTPA to 0.6 MTPA, Change of technology from Opencast to Underground, Village: Kaliapani, Tehsil: Sukinda, District: Jajpur (Odisha) has been granted vide letter No. No. J-11015/139/2012-IA.II (M) Dated: 22nd August, 2014 (copy attached) by Ministry of Environment, Forests & Climate Change Impact Assessment Division, Ministry of Environment, Forests & Climate Change Impact Assessment Division. The information regarding same order has been published in two news papers viz Dharitri (Odiya Daily News paper) on 1st Sept.2014 and Pioneer(English Daily News paper) on 31st August,2014(Copy same attached).

This is for your kind information.

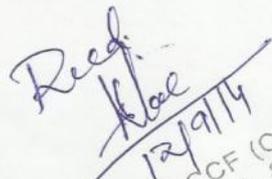
Thanking you and with regards,

Yours faithfully

For M/s. Balasore Alloys Ltd.


S.Gangopadhyay
Vice President (Mine)

Encl: As above


12/9/14
PS to APCCF (Central)
GOI, M/o Envt. & Forests
Eastern Regional Office
Bhubaneswar-751023