SUKINDA MINES (CHROMITE)

M/S INDIAN METALS & FERRO ALLOYS LTD.

Conditions of MoEF, Govt. of India, New Delhi vide MoEF Letter No - J-11015/346/2007-IA.II(M) Dated 18.06.2008 issued with Environmental Clearance with reference to **SUKINDA MINES (CHROMITE)** of M/s IMFA and **the Status of compliance** for same for the period from October 2011 to March 2012.

Sl No	Specific Conditions	Status
(i)	The environmental clearance shall be up to March, 2012 based on existing approved mine plan/scheme as modified from time to time. For environmental clearance to be valid beyond March, 2012,the proponent shall submit a copy of the mine plan duly approved by the Indian Bureau of Mines incorporating the ultimate pit slope angle, height of the proposed dump and clearly showing availability of adequate space to accommodate the waste to be generated for the entire mine life latest by December, 2011. If no such approved mine plan/scheme is submitted to the ministry of Environment and Forest, the environmental clearance shall seize to be valid beyond March, 2012.	The Mining Scheme for the period from 2009-10 to 2013-14 has been approved by IBM vide letter no. 314(3)/2009-MCCM(CZ)/Ms-28 dated 1st January, 2010. The same was submitted to the Ministry of Environment and Forest vide letter No. IMFA/SMC/2011 on dated 05.05.2011. The environmental clearance has been **extended** beyond 31st March'2012 for a further period of two years i. e. up to 31st March 2014 **by the MoEF vide letter No. J-11015/346//2007-IA.II(M) Dated 22nd May' 2012**, based on the approved mining scheme submitted.
(ii)	The project proponent shall obtain consent to establish from the state Pollution Control Board, Orissa and effectively implement all the conditions stipulated therein.	Consent to establish for production of 3.51 Lakh MT of Chrome ore per annum has been obtained from State Pollution Control Board vide SPCB Order No.3155/Ind-II-NOC-4869, dated 04/03/2010. All the conditions stipulated in consent to establish have been implemented effectively.
(iii)	The project proponent shall ensure that no natural watercourse / water body shall be obstructed due to any mining operation.	No natural watercourse/water body exist in the lease hold area and therefore there will be no effect to any natural watercourse/water body due to any mining operation.
(iv)	The top soil, if any, shall temporarily be stored at the earmarked site(s) only and it should not be kept un-utilized for a period more than 3 years. The topsoil should be used for land reclamation and plantation.	The top soil generated during the mining operation is fully utilised for plantation over dump slope and terraces. However, any top soil stored at the earmarked site shall not be kept un-utilised for a period more than 3 years. The details of generation and consumption of top soil is given in the table below:

		YEAR	**QUANTITY GENERATED IN CUM.**	**QUANTITY USED IN CUM.**	**QUANTITY STORED IN CUM.**
		1999-2000	NIL	N/A	NIL
		2000-01	14	14	NIL
		2001-02	12.6	12.6	NIL
		2002-03	24	24	NIL
		2003-04	30	30	NIL
		2004-05	412	412	NIL
		2005-06	1273	1273	NIL
		2006-07	1050	930	120
		2007-08	2857	2857	NIL
		2008-09	2755	2755	NIL
		2009-10	500	620	NIL
		2010-11	300	150	150
		2011-12	600	750	NIL
		Total	**9827.6**	**9827.6**	**NIL**
(v)	The solid waste in the form of over burden, sub-grade ore and nickel ore bearing material shall be stacked separately.	The solid waste in the form of over burden, sub-grade ore and nickel ore bearing material are being stacked separately.			
(vi)	The overburden generated shall be stacked at earmarked dump site only and it should not be kept active for a long period of time. The total height of the dump shall not exceed 60m. Proper terracing of OB dump should be carried out so that the overall slope shall not exceed 28 degree. The recommendations made in the slope stability study carried out through Central Mining Research Institute shall be effectively implemented. The OB dump should be scientifically vegetated with suitable native species to prevent erosion and surface run off. In critical areas, use of geo textiles shall be undertaken for stabilization of the dump. The over burden generated after the year 2018	The overburden generated is stacked at earmarked dump site and it is stabilized by vegetating scientifically with suitable native and other species without keeping the dump active for a long period of time. The total height of the dump is not exceeding 60m. Proper terracing of OB dump has been carried out so that the overall slope is not exceeding 28 degree. The recommendations made in the slope stability study carried out through Central Institute of Mining and Fuel Research are being implemented effectively. In critical areas, use of geo-textiles and grass thatching has been undertaken for stabilization of the dump.		

	amounting to 26.28 lakh m^3 till the year 2021, shall be backfilled. Backfilling shall start from the year 2018 onwards. Monitoring and management of rehabilitated areas should continue until the vegetation becomes self-sustaining. Compliance status should be submitted to the Ministry of Environment & Forests on six monthly basis.	After proposed scheme period 2009-10 to 2013-14 [Approval letter no No.314(3)/2009-MCCM(CZ)/MS-28 dated 01-01-2010] there will be space for about 19 LCuM waste to be accommodated on the same dump for the next scheme period i.e. 2014-15 to 2018-19. Back filling shall be proposed in the next scheme of mining (2014-15 to 2018-19). Monitoring and management of rehabilitated areas does continue until the vegetation becomes self-sustaining.
(vii)	Catch drains and siltation ponds of appropriate size shall be constructed for the working pit. OB and mineral dumps to prevent run off of water and flow of sediments directly into the Damsala Nallah and other water bodies. The water so collected should be utilized for watering the mine area, roads, plantation etc. The drains should be regularly desilted and maintained properly. Garland drains, settling tanks and check dams of appropriate size, gradient and length shall be constructed both around the mine pit and over burden dumps to prevent run off of water and flow of sediments directly into the Damsala Nallah and other water bodies and sump capacity should be designed keeping 50% safety margin over and above peak sudden rainfall (based on 50 years data) and maximum discharge in the area adjoining the mine site. Sump capacity should also provide adequate retention period to allow proper settling of silt material. Sedimentation pits should be constructed at the corners of the garland drains and desilted at regular intervals. Storm water return system should be provided. Storm water should not be allowed to go to the effluent treatment plant during high rainfall/ super cyclone period. A separate storm water sump for this purpose should be created.	Catch drains and siltation ponds of appropriate size have been constructed separately for the working pit, Over Burden dumps and other surface area to prevent run off of water and flow of sediments directly into the Damsala Nallah and other water bodies. The water so collected is being utilized for watering the mine area, roads, plantation etc. The drains are being regularly desilted and maintained properly. Garland drains, settling tanks and check dams of appropriate size, gradient and length have been constructed both around the mine pit and over burden dumps to prevent run off of water and flow of sediments directly into the Damsala Nallah and other water bodies. Sump capacity has been designed keeping more than 50% safety margin over and above peak sudden rainfall and maximum discharge in the area adjoining the mine site. Sump capacity also provides adequate retention period to allow proper settling of silt material. Sedimentation pits have been constructed along the garland drains and desilted at regular intervals. Storm water return system has been provided. Storm water is not allowed to go to the effluent treatment plant during high rainfall/ super cyclone period. A separate storm water sump for this purpose has been constructed.
(viii)	Dimension of retaining wall at the toe of over burden dump and OB benches within the mine to check run off and siltation shall be based on the rainfall data.	Dimension of retaining wall at the toe of over burden dump is 30 cm width and 1.2 m high, which is adequate to check run off and siltation.

(ix)	Mine water discharge and/or any waste water shall be properly treated to meet the prescribed standards before reuse/discharge. The run off from OB dumps and other surface run off should be analyzed for Cr^{+6} and in case its concentration is found higher than the permissible limit, the waste water should be treated before discharge/ reuse.	There is no mine discharge from quarry area in Band-I. Water is collected in a sump and used for dust suppression and plantation. However, an ETP plant was installed in 2004 to treat the water in event of any significant mine discharge in future and trail run conducted. Thereafter, ETP-I was not operated as there is no mine discharge available for disposal outside the ML area. The run-off from OB dumps and other surface run off is analysed for Cr+6 and it is found within permissible limit. In case its concentration is found higher than the permissible limit, provision is there for treatment before discharge as follows: (a) ETP-1 (195 Ltr/sec) for treating mine discharge from Band-I quarry. (b) ETP-2 (30 Ltr/sec) for treating rain water seepage from OB dump and ore storage. (c) ETP-3 (30 Ltr/sec) for treatment of surface run off from other area including Mahagiri Mines (Chromite) of M/s IMFA Ltd.
(x)	Effluents containing Cr^{+6} shall be treated to meet the prescribed standards before reuse/ discharge. Effluent Treatment Plant shall be provided for treatment of mine water discharge and waste water generated from the workshop and mineral separation plant.	Effluents containing Cr^{+6} is being treated to meet the prescribed standards before discharge. There are 3 nos of Effluent Treatment Plants, provided for treatment of mine discharge water, surface run off, seepage from OB dump and ore storage. However, waste water generated from the workshop is passed through oil and grease trap and recycled. At present, we do not have any mineral separation plant.
(xi)	Separate impervious concrete pits for disposal of sludge shall be provided for the safe disposal of sludge generated from the mining operations.	Separate impervious concrete pit for disposal of sludge has been provided for safe disposal of sludge generated from the mining operations.
(xii)	The first order natural stream/ channel originating from near the northern side of the ML shall be undisturbed and protected.	No natural water course/ water body has been obstructed due to mining activities.
(xiii)	Regular monitoring of water quality upstream and downstream of Damsala Nallah shall be carried out and record of monitoring data should be maintained and submitted to Ministry of Environment & Forests, its Regional Office, Bhubaneswar, Central Ground Water Authority, Regional Director, Central Ground Water Board, State Pollution Control Board and Central Pollution Control Board.	Regular monitoring of water quality upstream and downstream of Damsala Nallah is being carried out and record of monitoring data is being maintained and being submitted to Ministry of Environment & Forests, its Regional Office, Bhubaneswar. It is also being submitted to Central Ground Water Authority; Regional Director, Central Ground Water Board; State Pollution Control Board and Central Pollution Control Board.

(xiv)	The project proponent shall ensure that the quality of decanted effluents from the tailing pond, if any, conform to the prescribed standards before discharge. The decanted water from the tailing pond shall be re-circulated within the mine and there shall be zero discharge from the mine.	Presently there is no tailing pond. Whenever such situation will arise, it shall be complied .
(xv)	The project proponent shall explore the possibility to reduce concentration of Cr^{+6} in the tailing pond, if any, in consultation with an expert scientific institution like NEERI.	At present, there is no tailing pond. Whenever such situation will arise, it shall be complied .
(xvi)	Plantation shall be raised in an area of 73.01ha including a 7.5m wide green belt in the safety zone around the mining lease by planting the native species around ML area, OB dump, roads etc. in consultation with the local DFO/Agriculture Department. The tree density should be two thousands trees per hectare. At least 1500 trees per year shall be planted.	Plantation has been raised in an area of 18.824 ha including a portion of 7.5m wide green belt in the safety zone around the mining lease by planting the native species around ML area, over burden dump, roads etc. in consultation with the local DFO /Agriculture Department. The tree density is kept two thousands trees per hectare. More than 1500 trees are being planted every year.

Year of Plantation	Total Area Planted in Ha	Total No of Trees Planted	No of Trees survived	Survival %
1999-00	0.642	2774	2337	84
2000-01	1.210	4354	3791	87
2001-02	1.251	4719	4200	89
2002-03	1.176	5561	4939	89
2003-04	1.240	5300	4707	89
2004-05	1.265	5030	4275	85
2005-06	1.470	3842	3304	86
2006-07	0.880	4006	3484	87
2007-08	0.910	2169	1962	90
2008-09	0.960	2439	2344	96

		2009-10	2.180	6070	5970	98
		2010-11	2.500	2682	2628	98
		2011-12	3.140	7240	6301	87
		Total	**18.824**	**56186**	**50242**	**89**
(xvii)	Regular water sprinkling should be carried out in critical areas prone to air pollution and having high levels of PM_{10} and $PM_{2.5}$ such as haul road, 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.	Regular water sprinkling is being carried out in critical areas prone to air pollution and having high levels of PM_{10} and $PM_{2.5}$ such as haul road, loading and unloading points. It is ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.				
(xviii)	The project authority should implement suitable conservation measures to augment ground water resources in the area in consultation with the Regional Director, Central Ground Water Board.	Rain water harvesting structures are provided at our Colony premises and at our administrative office building.				
(xix)	Regular monitoring of ground water level and quality should be carried out by establishing a network of existing wells and constructing new piezometers in and around the mine lease. The monitoring should be carried out four times in a year, pre-monsoon (April-May), monsoon (August), post-monsoon (November) and winter (January) and the data thus collected may be sent regularly to the Ministry of Environment and Forests, its Regional Office located at Bhubaneswar, Central Ground Water Authority and Regional Director, Central Ground Water Board.	Ground water level and quality is being monitored four times a year – pre-monsoon, monsoon, Post-monsoon and winter. The data thus collected are being sent regularly to all the concerned authorities. Presently 2 Bore wells i.e. BW1- Inside the lease of adjoining Mines – MMC (upstream) and BW2 – Inside the lease of mine of SMC (down stream) are being monitored for ground water level inside the core zones and the data thus collected are being sent regularly to the Ministry of Environment and Forests, its Regional Office located at Bhubaneswar, Central Ground Water Authority and Regional Director, Central Ground Water Board.				
(xx)	Permission from the competent authority should be obtained for drawl of ground water, if any, required for the project.	Necessary permission has been obtained from Central Ground Water Authority vide permission no- CGWA/IND/Proj./2002-57 dt.14-03-2002 for drawl of 131 m^3/day ground water.				
(xxi)	Suitable rain water harvesting measures on long term basis shall be planned and implemented in consultation with Regional Director, Central Ground Water Board.	Rain water harvesting structures have been provided at our administrative office building area & residential premises.				

(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. The vehicles shall be covered with a tarpaulin and shall not be overloaded.	All the vehicles and machineries engaged in mines are having Certificates of Pollution under control from the authorised agencies. It is being monitored regularly. The vehicles engaged for transportation of mineral are covered with a tarpaulin and are not overloaded.
(xxiii)	Blasting operation shall be carried out only during the day time. Controlled blasting should be practiced. The mitigative measures for control of ground vibrations and arrest fly rocks and boulders should be implemented.	Blasting operation is carried out only during the day time. Controlled blasting is being practiced by using relays with detonators with suitable spacing & burden of blast holes to control the ground vibrations and arrest fly rocks.
(xxiv)	Drills shall either be operated with dust extractors or equipped with water injection system.	Drills are being operated with water injection system to enable elimination of generation of dust due to drilling operation.
(xxv)	Consent to operate shall be obtained from SPCB before starting enhanced production from the mine.	We have obtained Consent to operate from SPCB vide order no 6226/IND-I-CON-2274 dated 31.03.12 for producing 3.51 Lakh Tonne of Chrome ore per Annum, which is valid for the period up to 31.03.2013.
(xxvi)	Sewage treatment plant should be installed for the colony. ETP should also be provided for workshop and waste water generated from mining operations.	Domestic effluent generated in the colony are being discharged to soak pit via septic tank. For workshop, the used water is passed through oil and grease trap and the water is being reused. As the total system is impervious and the collected sludge is disposed in an impervious pit, the provision of ETP is not needed. Effluent treatment plants have been provided for the treatment of mine water discharge & surface runoff from OB dump and other areas of Mines.
(xxvii)	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.	At present, there is no mineral handling plant in the mines.

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<tr><td>(xxviii)</td><td>The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered fauna such as four horned antelope, mouse dear, great Indian hornbill, common pea fowl, python etc., 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. Copy of action plan may be submitted to the Ministry and its Regional Office, Bhubaneswar within 3 months.</td><td>Govt of Odisha have their own Regional Wildlife Conservation Plan for mining areas. Accordingly, DFO, Cuttack has advised the project proponent to release Rs.23.35 lakh for implementation of their Wildlife Management Plan in the mining area estimated at the rate of Rs.20,000 per hectare vide their OM No.1166 dated 16.03.2009. This amount has already been deposited with the Compensatory Afforestation Fund (CAF) as directed by the State Government.</td></tr>
<tr><td>(xxix)</td><td>The project proponent shall effectively address the concerns raised by the locals in the public hearing as well as during consideration of this project, while implementing this project.</td><td>The concerns raised by locals in public hearing as well as during consideration of the project are being addressed effectively.</td></tr>
<tr><td>(xxx)</td><td>A Final Mine Closure Plan along with details of Corpus Fund should be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.</td><td>It shall be complied in due course.</td></tr>
<tr><td>Sl No</td><td>B. General Condition</td><td>Status</td></tr>
<tr><td>(i)</td><td>No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forests.</td><td>No change in mining technology and scope of working shall be made without prior approval of the Ministry of Environment & Forests.</td></tr>
<tr><td>(ii)</td><td>No change in the calendar plan including excavation, quantum of mineral chromite ore and waste should be made.</td><td>No change in the calendar plan including excavation, quantum of mineral chromite ore and waste shall be made.
<table>
<tr><td>Excavation</td><td>Proposal As per Approved Mining Scheme for Year 2011-12</td><td>Actual in 1st Half year (April-11to Sept.-11)</td><td>Actual in 2nd Half year (Oct.11 to March-12)</td><td>Actual Total in the year.2011-12</td></tr>
<tr><td>Ore</td><td>3,50,250 MT</td><td>1,40,000 MT</td><td>1,86,500 MT</td><td>3,26,500 MT</td></tr>
<tr><td>Overburden / Waste</td><td>12,10,900 CuM</td><td>2,95,428 CuM</td><td>5,45,056 CuM</td><td>8,40,484 CuM</td></tr>
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(iii)	Periodic monitoring of ambient air quality should be carried out for RPM, SPM, SO_2 and NOx. Location of the monitoring 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 collected 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.	Periodic monitoring of ambient air quality have been carried out through our consultant, M/s. ERSI . The data thus collected is being 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.
(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.	Adequate measures like regular maintenance of the HEMM, acoustic enclosures with the DG sets etc have been implemented to control the noise levels. Workers engaged in operations of HEMM, etc have been provided with ear plugs/ muffs
(v)	Industrial waste water (workshop and waste water from the mine) should be properly collected, treated so as to conform to the standards prescribed under GSR 422(E) dated 19th May, 1993 and 31st December, 1993 or as amended from time to time. Oil and grease trap should be installed before discharge of workshop effluents.	The waste water of workshop is passed through the Oil and grease trap installed near the workshop. ETPs for treatment of Cr+6 are installed to treat any discharge and to keep them within the permissible limit. The hazardous solid waste so generated is being sent to an agency authorised by SPCB to treat it to render it safe for disposal.
(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. Occupational health surveillance programme of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed.	Personnel working in dusty areas are provided with nose mask. They are also provided with adequate training and information on safety and health aspects. Occupational health surveillance programme of the workers is being undertaken periodically to observe any contractions due to exposure to dust. Necessary corrective measures shall be taken, if needed. Medical examination includes tests/assessments like Chest X-Ray, Audiometry, Pathological investigation, Cardiological assessment & Neurological assessment are aslo being conducted regularly.
(vii)	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.	A separate environmental management cell with suitable qualified personnel has been set-up under the control of a Senior Executive, who is reporting directly to the Head of the Organization.

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<tr><td>(viii)</td><td>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.</td><td colspan="4">Complied</td></tr>
<tr><td rowspan="8">(ix)</td><td rowspan="8">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.</td><td colspan="4">Funds earmarked for environmental protection are exclusively spent for the purpose only. Year wise expenditure is reported to the Ministry.</td></tr>
<tr><td colspan="4">Expenses for the Year (2011-12)</td></tr>
<tr><td>Head</td><td>Amount (in lakh)Expenses for the first half of the Year (april'11 to Sept'11)</td><td>Amount (in lakh)Expenses for the second half of the Year (Oct'11 to March'12)</td><td>Total</td></tr>
<tr><td>For pollution control</td><td>21.18</td><td>11.36</td><td>32.54</td></tr>
<tr><td>For Environmental Monitoring</td><td>1.22</td><td>1.31</td><td>2.53</td></tr>
<tr><td>For green belt development</td><td>8.86</td><td>7.34</td><td>16.2</td></tr>
<tr><td>For occupational health & Environment awareness</td><td>0.58</td><td>0.64</td><td>1.22</td></tr>
<tr><td>Total</td><td>31.84</td><td>20.65</td><td>52.49</td></tr>
<tr><td>(x)</td><td>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.</td><td colspan="4">The officer(s) of the Regional Office at Bhubaneswar are provided full cooperation by providing the requisite data/ information/ monitoring reports as and when required.</td></tr>
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(xi)	The project proponent shall submit six monthly report on the status of the implementation of the stipulated environmental safeguards to the Ministry of Environment and Forests, its Regional Office, Bhubaneswar, Central Pollution Control Board and State Pollution Control Board.	The report on the status of the implementation of the stipulated environmental safeguards are being submitted regularly two times a year i.e. half yearly (April to Sept and Oct to March) to the Ministry of Environment and Forests, its Regional Office, Bhubaneswar, Central Pollution Control Board and State Pollution Control Board.
(xii)	A copy of clearance letter will be marked to concerned Panchayat/ local NGO, if any, from whom suggestion/ representation, if any, was received while processing the proposal.	Complied
(xiii)	State Pollution Control Board should display a copy of the clearance letter at the Regional Office, District Industry Centre and Collector's office/ Tahsildar's office for 30 days.	Complied.
(xiv)	The project authorities should advertise at least in two local newspapers 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.	Complied.

Mines Manager

Sukinda Mines (Chromite)