Combined Six Monthly Compliance Status of Environmental Clearance Conditions – "Unchabali Iron and Manganese Ore Mines & Iron ore Beneficiation Plant of M/s Indrani Patnaik" located in village(s) Unchabali & Balda, Sub-division Champua, District Keonjhar, Orissa.

SP. Cond. NO.	SPECIFIC CONDITION	PRESENT STATUS
I. **II.(B.P)**	**The project proponent shall obtain Consent to Establish and Consent to Operate from the State Pollution Control Board, Orissa and effectively implement all the conditions stipulated therein.**	As per requirement, the project has been obtained Consent to establish & Consent to Operate from SPCB, Orissa for 4.00 MTPA Iron ore production & 2.00 MTPA capacity of Iron ore beneficiation plant. The obtained Consent to Operate includes two numbers of 200 TPH mobile crusher plant, two numbers of 150 TPH mobile crusher plant, three numbers of 250 TPH mobile screen plant and one number of Iron ore beneficiation plant with capacity of 2.00 MTPA feed materials. The compliance to the conditions stipulated in the approved consent to establish & consent to operate has been implemented effectively. The latest consent to operate compliance report has been submitted to SPCB, Orissa for the year 2018-2019, and the same is enclosed as **Annexure-1.**
II. **I(B.P)**	**Necessary forestry clearance under the Forest (Conservation) Act, 1980 for an area of 103.432ha forestland involved in the project shall be obtained before starting mining operation in that areas. Till such time mining activities shall be restricted to an area of 67.16haof forestland for which approval under section-2 of the forest (Conservation) Act, 1980 was granted by the Ministry of Environment and Forests on 03.05.2007. Environmental Clearance is subject to grant of forestry clearance. No mining shall be undertaken in the forest area without obtaining requisite prior forestry clearance.** **No activity relating to the project**	As per condition, the forest clearance has been obtained from MoEF for an area of 103.432 Ha in two phases under the Forest (Conservation) Act, 1980. First phase forest clearance was obtained on 03.05.2007 for an area of 35.275 Ha., vide MoEF letter no: 8 (21)40/2004-FCE dated 03.05.2007 and second phases forest clearance has been obtained on 31.09.2015 over an area of 68.157 Ha., vide MoEF& CC letter no F.NO.8-67/2014-FC dated on 31.09.2015**.** The copy of the forest clearances obtained from MoEF& CC is attached as **Annexure -2** (First phase for 35.275 Ha) & **Annexure -3** (Second phase for 68.157 Ha).

	shall be undertaken in the forestland for which forestry clearance under the forest (conservation) Act, 1980 has not been obtained. The environmental clearance is subject to grant of forestry clearance.	
III.	**The environmental clearance is subject to approval of the State Land use Department, Government of Orissa for diversion of agricultural land for Non-agricultural use.**	There is no agricultural land within in the mine lease area. Therefore, the said diversion from state land use department is not applicable.
IV.	**The mining operations shall be restricted to above ground water table and it should not intersect groundwater table. In case of working below the ground water table, prior approval of the Ministry of Environment & Forests and Central Ground Water Authority shall be obtained, for which a detailed hydrological study shall be carried out.**	The present mining operation is restricted to above the ground water table and there is no proposal to intersect the ground water table as per the approved Scheme of Mining. The Project has carried out detailed hydrology and hydro geological study through and as per hydrology study report the ground water table exists at 478 aMSL and present mine working operation is at 530 AMSL. In case of ground water table intersection in future, the project will abide the said condition and will get prior approval from MoEF& CGWA.
V. **XIII. (B.P)**	**The project proponent shall ensure that no natural watercourse and/or water resources shall be obstructed due to any mining operations. Adequate measures shall be taken for conservation and protection of the seasonal streams, if any emanating from the mine lease area during the course of mining operation.** **Appropriate mitigate measures should be taken to prevent pollution of the Baitarani river, in consultation with the State Pollution Control Board.**	No water course and / or water resources are being obstructed due to our mining operation. To ensure the same project has been under taken runoff management study and prepared site specific runoff management plan through KRG Rain Water Foundation, Chennai. Under the site specific runoff management plant, project has under taken various mitigate measure in and around the mine lease area. **Mines runoff management during monsoon period:** The mines runoff water is not allowed for direct discharge from mine lease area.

		Hence, the entire generation of mines runoff water (during monsoon period) is collected to the bottom of the pit, checks dams and check weirs and after treatment through silt cum Sedimentation by giving adequate retention period, the final water is allowed to discharge. However, the entire mine area and check dams/check weirs connectivity is properly made by proper drainage pattern. All the implementations have been carried out with consideration of maximum rain fall and technical design followed as per KRG rain water harvesting recommendation. The detailed implementation of check dams and check weirs is given in **table -1**. **Nallah Protections measures:** In addition to the site specific mitigation measures, the project has been carried out various Nallah protection measures around the mines premises. The implementations are follows. ✓ Nallah banks are protected by Guard wall with proper filtration arrangements to avoid entry of the any silt carry over to the water bodies during rainy season from other sources. ✓ Check weirs/check dams are conferred along the Nallah passing area to persuade silt sedimentations. ✓ Nallah de-siltation is under taken during pre-monsoon period to maintain its bio cycle. ✓ Nallah both side slopes are pitched with loose boulders to avoid the barrier erosion during monsoon

		period. Plantation and Vettiver plantation was carried out all along the Nallah boundaries and few areas is converted as green barriers. The detailed implementation is given in **table -2** and photo evidence for the same is given below. **Water Harvesting:** The project has constructed/ developed four numbers of water harvesting ponds in surrounding villages to encourage the water table. The ponds are regularly de-silted and well maintained on regular basis. The detailed implementation is given in **table -3.** **<u>Dump Management:</u>** **Dump Preparation:** Proper terracing, slope level and sub benches are maintained in all mines waste / sub grade dump. **Retention wall:** Bottom of the OB dump and sub grade dump provided / constructed with adequate size of retention wall to avoid the dump failure during monsoon period. **Drainage Pattern:** Proper drainage pattern is provided at bottom of the waste / sub grade dumps and other required area to collect & treat the mines runoff water. **Coir-mat and plantation:** Surface area of the waste /sub grade dump is covered with plantation / coir geo textile application along with local grass seeds to avoid the dump erosion during monsoon period. The detailed implementation is given in **Table – 4.** **Photo evidence is given below as PHOTOS-1.**

VI.	**The top soil, if shall temporarily be stored at earmarked site(s) only and should not be kept unutilized for long, the topsoil should be used for land reclamation and plantation.**	No top soil was generated during this reporting period, because the current mining operation is restricted within the already diverted forest area and there is no new development in the reporting period. In case of top soil generation taken place in the future, it will be stored inane earmarked area and necessary safeguard measures will be under taken to preserve its nutrients values, so that it will be used for future land reclamation and raising of plantations.
VII.	**The project proponent shall not undertake beneficiating of the mineral as part of this project. For understanding beneficiation, necessary prior approval under the provisions of EIA Notification, 2006 shall be obtained.**	In this regard project has been obtained Environment clearance from Ministry of Environment & Forest, Government of India vide letter no. J-11015/273/2009-IA.II (M) dated 31.05.2011 for setting up iron ore beneficiation plant for capacity of 2.0 MTPA (2 x 185 TPH). A copy of the Environmental Clearance obtained from MoEF for undertaking beneficiation within lease area is enclosed as **Annexure – 4.**
VIII.	**The over burden (OB) generated during the mining operation shall be temporarily stacked at earmarked dump site(s) only for back filling. Back filling shall commence from the year 2011-2012 onwards. The accumulated waste shall be liquidated by the year 2016 and there shall be no external dump thereafter. The back filled area shall be reclaimed by plantation. Monitoring and management of rehabilitated areas shall continue until vegetation becomes self-sustaining. Compliance status should be submitted to the Ministry of Environment & Forests and its Regional office, Bhubaneswar on six monthly basis.**	The generated over burden and / waste is stacked at earmarked dump site as per approved mining plan and no back filling and reclamation is being under taken till date. As per approved Scheme of Mining, the backfilling will commence from 2019-2020 onwards. So, reclamation will be carried out after 2019-2020 as per the approved Scheme of Mining approved by Indian Bureau of Mines, Govt. of India. However, the existing O.B dump is preserved with proper manner to the future reclamation. Such as like proper dozing, terracing, adequate slope, ditching and Plantation.

IX.	**Catch drains and siltation ponds of appropriate size should be constructed around the mine working soil, mineral and temporary OB dumps to prevent runoff water and flow of sediments directly into the Baitarani river, the Jalpanadi, the Kasinallah, the Dolkonallah, Dalkinallah, the Ghaghara nallah, the Jagdharanadi, the Gahirjalanallah, the Mithida spring and other water bodies. The water so collected should be utilized for watering the mine area, roads, green belt development etc. The drains shall be regularly de – silted particularly after monsoon 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 the temporary OB dumps to prevent runoff water and flow of sediments directly into the Baitarani river, the Jalpanadi, the Kasinallah, the Dolkonallah, Dalkinallah, the Ghagaranallah, the Jagdharanadi, the Gahirjalanallah, the Mithida spring and other water bodies and dump 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. Dump capacity should also provide adequate retention period to allow proper settling of silt material. Sedimentation pits should be constructed at the corners of the**	The project has under taken varies Mitigative measures on the above. The detailed implementation is follows. **<u>Dump Management:</u>** **Dump Preparation:** Proper terracing, slope level and sub benches are maintained in all mines waste / sub grade dump. **Retention wall:** Bottom of the OB dump and sub grade dump provided / constructed with adequate size of retention wall to avoid the dump failure during monsoon period. **Drainage Pattern:** Proper drainage pattern is provided at bottom of the waste / sub grade dumps and other required area to collect & treat the mines runoff water. **Coir-mat and plantation:** Surface area of the waste /sub grade dump is covered with plantation / coir geo textile application along with local grass seeds to avoid the dump erosion during monsoon period. **<u>Mines runoff management during monsoon period:</u>** The mines runoff water is not allowed to direct discharge from mine lease area. Hence, the entire generation mines runoff water (during monsoon period) is collected to the bottom of the mines pit, checks dams and check weirs and after treatment (Silt Sedimentation by giving adequate retention period) process the final water is allowed to discharge. However, the entire mine area and check dams/check weirs connectivity is properly made by preplanned drainage pattern. All the implementations have been carried out with consideration of maximum rain fall and technical design is followed as per KRG rain water harvesting recommendation.

	garland drains and de - silted at regular intervals.	**Nallah Protections measures:** In addition to the site specific mitigation measures, the project has been carried out various Nallah protection measures around the mines premises. The implementations are follows. ✓ Nallah banks are protected by Guard wall with proper filtration arrangements to avoid entry of the any silt carry over to the water bodies during rainy season from other sources. ✓ Check weirs/check dams are conferred along the Nallah passing area to persuade silt sedimentations. ✓ Nallah de-siltation is under taken during pre-monsoon period to maintain its bio cycle. ✓ Nallah both side slopes are pitched with loose boulders to avoid the barrier erosion during monsoon period. ✓ Plantation and Vettiver plantation was carried out all along the Nallah boundaries and few areas is converted as green barriers. **Water Harvesting:** The project have been constructed/ developed four numbers of water harvesting ponds in surrounding villages to encourage the water table. The ponds are regularly de-silted and well maintained on regular.

X.	**Dimension of the retaining wall at the toe of the temporary over burden dumps and OB benches within the mine to check run-off and siltation should be based on the rain fall data.**	Based on rain fall data, the retaining wall for the length of 210 RM x 2 Mtr (H) x 1.5 Mtr (W) has been constructed at varies location like bottom of the OB dump, sub grade dump & other required area to check the runoff. PHOTOS ARE ATTACHED BELOW AS **PHOTO-2**
XI. **VII (B.P)**	**Plantation shall be raised in an area of 98.8627ha including a 7.5 m green belt in the safety zone around the mining lease, back filled and reclaimed area, mine benches, along the 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 hectare.** **A green belt of adequate width shall be developed all around the plant by planting the native species in consultation with the local DFO/Agriculture department within first five years.**	As per condition, the plantation will be raised for an area of 98.8627 Ha after completion of the mines life / end of the mine operation in mine lease, back filled area and reclaimed area, mine benches, along the roads etc. However, during running mine operation project has carried Plantation at various location like safety zone, waste dump, mines plant area, mines haul road, village roads, villages schools and railway sidings in consultation with the local DFO. Till reporting period a total number of 90503 numbers of saplings has been planted and the survival rate is 69 %, on an average of 62449 species survived up to this reporting period. A comprised year wise plantation details are enclosed as **TABLE.-5A** and type of plants planted in the year was given in the **TABLE- 5B**. Photo evidence for the plantation inside and out lease area is given below. PHOTOS ARE GIVEN BELOW AS **PHOTOS-3**
XII. **IV, VI & VII (B.P)**	**Effective safe guard measures such as regular water sprinkling should be carried out in critical areas prone to air pollution and having high levels of SPM and RSPM 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**	The project has implemented different type of dust suppression system to arrest the air pollution from the source level in and around the mines premises. The detailed implementations are follows. ✓ Fixed type water sprinklers are implemented in mines permanent haul roads and dispatch roads. ✓ Mines benches, temporary haul roads and other processing areas dust

	Board in this regard. **The Project Proponent shall carry out conditioning of the ore with water to mitigate fugitive dust emission.** **Necessary safeguard measures shall be taken for effective control of particulate levels (PM10) in the area. The safeguard measures shall be implemented within first three months and their effectiveness shown with supporting data of actual air quality monitoring.**	generation is suppressed by use of mobile water tankers. In this regard project has engaged two no. of 25 KL mobile water tanker, which is inbuilt with high pressure hydraulic sprinkling system. ✓ Five numbers of 8 KL capacity mobile water tankers is being used for dust suppression in the Public roads, railway sidings approaching roads & railway yards. ✓ Portable type trolley mounted sprinkler has been placed in loading & unloading points to avoid the dust generations. Haulage roads are being maintained with grader and water sprinkling to avoid any sort of ruts and potholes. Detailed implementation is given in **table – 6**. **DUST SUPPRESSION IN CRUSHER & SCREEN PLANT:** Effective dry fog system is implemented in all the crusher and screen plants. Beneficiation plant, the entire process is in wet condition except hopper area and the hopper is provided with dry fog to avoid the dust generation. To avoid the flow of air born dust from convey belt movement the conveyor belts of crusher and screen Plants are covered with hoods. **MONITORING** The monitoring of AAQ is being done in the core as well as buffer zone of the ML area, there are 3 no. of monitoring station in core zone i.e. Mines Office and Eastern Site of ML Area and there are 3 no. of monitoring stations in the buffer zone such as Unchabali Village, Balda Village, Nayagarh

		Village, Monitoring of AAQ is carried out every month except monsoon season. The monitoring report for the period Oct 2018 to March 2019 reveals that the parameter like PM10, PM2.5, SO2 and NOx are well within the norms as per NAAQs notifications made by the CPCB. A comprised AAQ monitoring reports for the reporting period is enclosed as **TABLE.-7.** PHOTOS ARE GIVEN BELOW AS **PHOTOS-4**
XIII.	**Regular monitoring of the flow rate of the springs and perennial nallah shall be carried out and records maintained.**	Regular monitoring of flow rate of different water bodies is being carried out seasonally by covering the Nallah/rivers i.e. Baitarani River, Unchabali Nallah, Kashi Nallah, Jalpa Nallah, Gahirajala Nallah, Dolko Nallah &Dalki Nallah. Latest flow rate monitoring reports are enclosed as **TABLE-8.**
XIV.	**SPECIFIC CONDITION – 14 (4.00 MTPA)** **Regular monitoring of water quality upstream and downstream of the Kasinallah, the Dolkonallah, the Dalkinallah, the Ghagranallah, the Gahirajalanallah and the Mithida spring shall be carried out and record of monitored data should be maintained and submitted to Ministry of Environment and Forest, its Regional Office, Bhubaneswar, the Central Ground Water Authority, the Regional Director, the Central Ground Water Board, the State Pollution Control Board and Central Pollution Control Board.**	Monitoring of water quality of Baitarini River, Unchabali Nallah, Kasi Nallah, Jalpa Nallah, Gahirjala Nallah, Mithida Spring and Dalco Nallah is being carried out seasonally. The monitoring data covers a total of 41 parameters and results are very well within the norms. The data is being maintained and submitted to authorities regularly. Latest surface water quality report analysed during last monsoon is enclosed as **TABLE.-9.**
XV. **IX (B.P)**	**The project authority should implement suitable conservation measures to augment ground resources in the area in consultation with the Regional Director, Central Ground Water Board.**	In this regard project has been engaged KRG RAIN WATER FOUNDATION, CHENNAI in consultation with Regional Director, CGWB and Bhubaneswar for technical guidelines and implemented various conservation measures to augment the ground water resources for in and around the mine lease

		area. The detail for the same is as follows; **ROOFTOP RAINWATER HARVESTING:** Rooftop rain water harvesting system has been implemented at mines employee camp and Unchabali dispensary towards water augment. The technical design and other parameters are followed as recommended by KRG rain water harvesting with consultation of regional director, CGWB, Bhubaneswar. From this establishment 4200 CUM/ANNUAL water is recharged to the ground. The project has developed/ constructed four numbers of water harvesting ponds to in mines surrounding villages to encourage water augment. The ponds are regularly de-silted and well maintained. Total harvesting pond water holding capacity is 1.5 Lakh CUM/ANNUM. The details are given in **TABLE.-3.** **SETTLING CUM PERCOLATION POND & CHECK DAMS:** Based on hydrology study the project has implemented five number of the check dams where soil is having high percolation rate and one number of percolation pond is provided at the south side ML area by considering the water flow. The same details are given in **TABLE.NO.-1.** **The photo evidences are attached as PHOTOS-5**
XVI. **X (B.P)**	**Regular monitoring of ground water level and quality should be carried out in around the mine lease by establishing a network existing wells and installing new piezometers during the mining operation. The periodic monitoring [(at least four times in a year Pre –monsoon (April-May), Monsoon (August), Post monsoon**	- **GROUND WATER QUALITY:** Ground water quality is being monitored regularly by seasonally at 10 locations including core and buffer zone. The monitoring locations are namely 1) Inside Mining lease area, 2) Unchabali village, 3) Kalimatti village, 4) Balda Village, 5) Malda Village, 6) Siljora Village, 7) Nayagarh Village, 8) Basanthapur Village, 9)

	(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 Ministry of Environment and Forests and its Regional Office, Bhubaneswar, Central Ground Water Authority and Regional Director, Central Ground Water Board. If at any stage, it is observed that the ground water table is getting depleted due to the mining activity; necessary corrective measures shall be carried out.	Employee's camp & 10) Jaganathpur. The latest ground water quality report is enclosed as **Table-10.** - **GROUND WATER LEVEL:** The ground water level is being monitored by seasonally i.e. pre-monsoon, monsoon, post monsoon and winter. The latest ground water level report is given in **table-11.** - **INSTALLING NEW PIEZOMETER:** The project has installed Piezometers at mines observation bore wells. The ground water fluctuations are being observed in the bore well & results are recorded by regular intervals. The latest month piezometer observation data is given **as annexure -5.**
XVII.	**Appropriate mitigate measures should be taken to prevent pollution of the Baitrani river, the Jalpanadi and Jagdharanadi in consultation with the State Pollution Control Board.**	Site specific mitigation measures to prevent silt carried into nearby natural water bodies got implemented like; surface run off management structures, retaining wall followed garland drains, check dam, settling cum percolation ponds etc. Apart from that, guard wall have been constructed across the bank of the natural water bodies. The above structures got developed in consultation with SPCB, Orissa. The detailed Site implementation details are given in **TABLE.NO.-1, 2, 3 & 4**.
XVIII. **XI (B.P)**	**The project proponent shall obtain prior permission of the competent Authorities for drawl of requisite quantity of water (surface water and ground water) required for the project.**	The project has obtained the ground water NOC from Central Ground Water Authority vide letter No.21-4(88YSER/GGWA/2008-1903 for withdrawal quantity of 1175 CUM/D of ground water. The obtained NOC from CGWA is enclosed as **ANNEXURE – 6.**
XIX. **XII (B.P)**	**Suitable rainwater harvesting measures on long term basis shall be planned and implemented in consultation with Regional Director, Central Ground Water Board.**	- **ROOFTOP RAINWATER HARVESTING:** The project has been implemented rooftop rain water harvesting system at project employee's camp and Unchabali dispensary towards ground water re-charge. The

		technical design and other parameters are followed as recommended by KRG rain water harvesting with consultation of regional director, CGWB, Bhubaneswar. From this establishment 4200 CUM quantity of ground water is recharged to the ground water table every year. - **WATER HARVESTING PONDS AT VILLAGES:** The project has developed four numbers of water harvesting ponds to encourage the water percolation and water harvesting in surrounding villages. The ponds are regularly de-silted and well maintained. Total harvesting pond water holding capacity is 1.5 lakh CUM/ANNUM. Details of harvesting ponds developed in surrounding villages are given in **TABLE NO.-3.** - **PERCOLATION POND & CHECK DAMS:** Based on hydrology study the project has implemented five number of the check dams, settling cum percolation pits where soil is having highly percolating rate and one number of percolation pond is provided at the south side of the broken up area. Details of check dams and check weirs are follows as **TABLE NO.-1**.
XX.	**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 mineral transportation shall be carried out through the covered trucks only and vehicles carrying the mineral shall not be overloaded. No transportation of ore outside the mine lease area shall be carried out after the sunset.**	The project is ensuring vehicle emission monitoring for all mining and other supporting vehicles / equipment. The monitoring of vehicle emission is carried out through Diesel Smoke Meter by engage of THRIVENI Pollution Testing Centre, Unchabali Village, Keonjhar, Pin-758034.A sample HEMM emission test result is attached as **Annexure-7.** Apart from testing of transporting vehicles emission on random basis, the project has been introduced a software technology RF ID system in entry gate of the mines, this system is having automatic functions to read

		the status of the vehicle pollution certificate validity and other relevant parameters. Basically, the baseline data of the vehicle is being loaded in the initial entry of the vehicle to the mines and it is regularly monitored in every trip of entry in gate, if any vehicles are not having valid pollution certificate or any other parameters then automatically entry of the vehicle will be not allowed by system.
XXI.	**No blasting shall be carried out after the sunset. Blasting operation shall be carried out only during daytime. Controlled blasting shall be practiced. The mitigate measures for control of ground vibrations and to arrest fly rocks and boulders should be implemented.**	No blasting is carried out after the sunset and blasting is carried out only at day time. The control blasting is practiced using lager top stemming column, the Nonel technology and proper blast design& firing pattern with effective supervision of total blasting operations as per the recommendation of the CIMFR, DHANDBAD. As on date no records reveals beyond the permissible limit during the reporting period. A summarized report for the reporting period is enclosed as **TABLE NO.-12** and a sample report is enclosed as **ANNEXURE -8.**
XXII.	**Drills shall either be operated with dust extractors or equipped with water injection system.**	The drilling operation is being carried out with both dust extractor and water injection system. Presently the project is using DP 1100 drilling machine for drilling operation. The said drilling machine is inbuilt with both water injection system and dust extraction systems. The photo evidence for the same is given below. PHOTO evidences given below as **PHOTOS-6**
XXIII.	**Mineral handling plant should 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.**	1) Effective dry fog system is implemented in all the crusher and screen plants. 2) In Beneficiation plant, the entire process is in wet condition except hopper area and the hopper is provided with dry fog to avoid the dust generation. 3) The conveyor belts of crusher and screen Plants are covered with hoods. 4) Regular water sprinkling is carried out in the loading and unloading area.

XXIV.	**Sewage treatment plant should be installed for the colony. ETP should also be provided for workshop and waste water generated during mining operation.**	STP is provided / implemented along with the skimmer mechanism at mines employee's camp for treatment and reuse of the waste domestic water from Kitchen, toilet and etc. The treated water is used for plantation and dust suppression activities. ETP is provided at mines work shop for the treatment of waste water from water service of equipment. The existing ETP is having physical separation of oil and grease by oil trapping system and silt sedimentation pit. The both STP and ETP final discharge water is being monitored on fortnightly once to ensure the final discharge water in line to approved CTO and record maintained for the same. The latest monitoring report is enclosed here as **table. No – 13 and table. No 14.** Photo evidences given below as **PHOTOS-7**
XXV. **XIV (B.P)**	**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.**	Initial Medical Examination & Periodical Medical Examination is being carried out to all company & contractors employees on regular basis. The IME & MPE is being carried as per in compliance to Mines Act 1952 & rules 1956 and amendments there to. During the reporting period (Oct 2018 to March 2019) project has carried out IME & PME for 18 employees. The IME & PME tests include PFT, X-Ray, and lung spirometer etc. A comprised summery report for IME & MPE during report period is enclosed as **Annexure – 09.**
XXVI. **XVII (B.P)**	**The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered fauna namely elephant, sloth bear, etc. spotted in the study area. Action plan for conservation of flora and fauna shall be prepared and implemented in consultation**	The Site Specific Wildlife Conservation Plan got prepared by Sri. S. K. Patnaik, Retd. IFS & Shri S.K.Mohanty, Retd. OFS with an estimated cost of Rs. 104 lakh and approved by PCCF-Wild Life and Chief Wild Life Warden. In which Rs. 34 lakh has been earmarked for implementation of Site Specific Wild Life Conservation Plan within the Mining Lease area and Rs. 70 Lakh has

	with the State Forest and Wildlife Department. All the safeguard measures brought out in the wild life conservation plan prepared specific to this project site shall be effectively implemented. Necessary allocation of the funds for implementation of the conservation plan shall be made and funds so allocated shall be included in the project cost. A copy of action plan may be submitted to the Regional Office of the Ministry of Environment and Forests, Bhubaneswar.	been earmarked for implementation for the purpose in the buffer zone i.e. within the zone of influence. An amount of Rs. 15, 91, 691/- rupees has been made towards Regional Wild Life Management Plan and Rs. 21, 75, 000/- rupees towards site specific Wild Life Management Plan. Various activities has been under taken towards protection of wild animals by implementation of solar electric fencing in mines operation boundary area to avoid the fall down of any wild animals to mines operation, awareness program among local and staffs members etc. The approved budgetary forecast for the site specific wildlife conservation plan is enclosed as **Annexure – 10**.
XXVII. **XVI (B.P)**	**Provision shall be made for the housing of the construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.**	Not Applicable. As there is no such construction activity
XXVIII.	**The critical parameters such as SPM, RSPM, NOx in the ambient air within the impact zone, peak particle velocity at 300m distance or within the nearest habitation, whichever is closer shall be monitored periodically. Further, quality of discharge water shall also be monitored [TDS, DO, pH and total suspended solids (TSS)]. The monitored data shall be uploaded on the website of the company as well as displayed on a**	All these critical parameters are being monitored periodically & uploaded on the company website i.e. www.uimm-ip.com. The said monitored parameters i.e. for AAQ; PM10, PM2.5, SO2, NOx, STP, ETP discharge, for surface run off discharge from the mine (treated) etc. is being displayed through an Electronic display board installed at the main gate of the project site of the company for public domain. Environmental parameters uploaded in the company website are enclosed as **Annexure – 11** and photo of the display board is given

	display board at the project site at a suitable location near the main gate of the company in public domain. The circular no. J-20012/1/2006-IA.II (M) dated 27.05.2009 issued by Ministry of Environment and Forests, which is available on the website of the Ministry www.envfor.nic.in shall also be referred in this regard for its compliance.	below AS **PHOTO-8.**
XXIX.	**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.**	The Project has submitted a Bank guarantee of Rs. 17,43,693/-for reclamation and rehabilitation of 69.7477 Ha mined out and other allied activities area @ 25, 000/- Ha as a part of the management of the mines closure of the Project.
III.(B. P)	**The water recovery and spill way system shall be so designed that the natural water resources are not affected and that no spill water goes into the nearby rivers.**	The existing beneficiation plant is well designed with principle of the maximum water recovery and zero spills called zero discharge based Beneficiation plant. In consequence of that, the plant entire water circuit is developed by closed manner, and process water from all the consuming point is being collected to thickener by proper pipe line arrangement. However, with use of thickener process and filter press mechanism about 97% of the water is being recovered and reused for the plant operation.
V (B.P)	**The cake generated from the filter press shall be dumped initially for two years along with the overburden as inter mixed layers and thereafter shall be filled back into the mined out area. Compliance status shall be submitted to the ministry of environment & forest and its regional office located at**	The generation of filter press waste i.e. filter cake is being dumped along with overburden dump as inter mixed layers. As per latest approved mining scheme the period of reclamation is occurring on the year of 2019-2020, the backfilling of filter press waste along with overburden will be carried out during above said period. Regarding compliance status, we will follow the said condition for submission of compliance

	Bhubaneswar on six monthly bases.	report to MoEF& Regional office located at Bhubaneswar.
XV (B.P)	**Occupational health surveillance program of the workers shall be undertaken periodically to observe any contractions due to exposure to the dust and take corrective measures, if needed; health records of the workers shall be maintained.**	Workers engaged in Operations are provided with earplugs / muffs, besides this acoustic enclosure for all machine operating cabins are provided. It is being monitored by Noise Level Meter; the results reveals very well within norms. Initial Medical Examination & Periodical Medical Examination is being carried out to all company & contractors employees on regular basis. The IME & MPE is being carried as per in compliance to Mines Act 1952 &rules 1956 and amendments there to. During the reporting (Oct 2018 to March 2019) project has carried out IME & PME for 18 employees. The IME & PME tests include PFT, X-Ray, and lung spirometer etc. A comprised summery report for IME & MPE during report period is enclosed as **Annexure – 09.**

<table>
<tr><th>General Cond. No</th><th>General condition</th><th>Present Status</th></tr>
<tr><td>I.

I (B.P).</td><td>No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forest.

No further expansion or modifications in the plant shall be carried out without prior approval of the ministry of Environment and Forests.</td><td>The Mining method of the project is fully mechanized having shovels, dumper combinations and sorting and sizing of the Iron Ore and it's being followed as per the approved Scheme of Mining/Plan.</td></tr>
<tr><td>II.</td><td>No change in the calendar plan including excavation, quantum of mineral iron ore and waste should be made.</td><td>There is no change in the calendar plan, the excavation, quantum of mineral iron ore and waste are being produced as per the approved mining plan/scheme. The details of the iron ore and waste are as follows;
<table>
<tr><th>Year</th><th>ROM (In Mt.)</th><th>OB Removed (In Mt.)</th></tr>
<tr><td>2017-2018</td><td>3990662</td><td>840938</td></tr>
<tr><td>2018-2019</td><td>3787130</td><td>1363949</td></tr>
</table></td></tr>
<tr><td>III.
II (B.P)</td><td>At least Four Ambient Air Quality – Monitoring stations should be established in the core zone as well as in the buffer zone for RPM, SPM, SO2& 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.</td><td>The monitoring of AAQ is being done in the core as well as buffer zone of the ML area, There are 3 no. of monitoring station in core zone i.e. Mines Office and Eastern Site of ML Area and there are 3 no. of monitoring stations in the buffer zone such as Unchabali Village, Balda Village, Nayagarh Village, Monitoring of AAQ is carried out every month except monsoon. The monitoring report for the period October to March 2018 reveals that the parameter like PM10, PM2.5, SO2 and NOx are as per NAAQs notifications made by the CPCB, are very well within the norms. The detailed monitoring location enclosed as Annexure-12.</td></tr>
<tr><td>IV.</td><td>Data on ambient air quality (RPM,</td><td>Data on ambient air quality (PM10, PM2.5, and</td></tr>
</table>

III (B.P)	**SPM SO2&NOx) 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.**	SO2 & NO_x) is being submitted once in six monthly basis to State Pollution Control Board. The latest submission is enclosed as **Annexure –13.**
V. **IV (B.P)**	**Fugitive dust emissions from all the sources should be controlled regularly water spraying arrangement on haul roads, loading and unloading and transfer points should be provided and properly maintained.**	The project has implemented different type of dust suppression system to arrest the fugitive dust emission from the source level in and around the mines premises. The detailed implementations are follows. ✓ Fixed type water sprinklers are implemented in mines permanent haul roads and dispatch roads. ✓ Mines benches, temporary haul roads and other processing areas dust generation is suppressed by use of mobile water tankers. In this regard project has engaged two no. of 25 KL mobile water tanker, which is inbuilt with high pressure hydraulic sprinkling system. ✓ Five numbers of 8 KL capacity mobile water tankers is being used for dust suppression in the Public roads, railway sidings approaching roads & railway yards. ✓ Portable type trolley mounted sprinkler has been placed in loading & unloading points to avoid the dust generations. ✓ Haulage roads are being maintained with grader and water sprinkling to avoid any sort of ruts and potholes. The latest monitoring report is enclosed here as **Table. No – 15.**
VI. V (B.P)	**Measures should be taken for control of noise levels below 85 dB(A) in the work environment. Workers engaged in operations of HEMM, etc. should be provided with ear plugs / muffs.**	Regular maintenance of HEMM & Processing plants is being carried out to minimize the noise level from source. Apart from that, proper PPEs like ear plug, muffles are also provided to employees. Further, to ensure the noise limit, regular noise monitoring is carried out on

		fortnightly basis for work zones like crusher plant premises, screen plant premises, ROM loading point, beneficiation plant premises, drilling area & work shop. The noise levels are well within prescribed norms, the monitoring reports are given in **table -16.**
VII. VI (B.P)	**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 31th December, 1993 or as amended from time to time. Oil and grease trap should be installed before discharge of workshop effluents.**	STP is provided / implemented at mines employee's camp for treatment and reuse of the waste domestic water from Kitchen, toilet and etc. The treated water is used for plantation and dust suppression activities. ETP is provided at mines work shop for the treatment of waste water from water service of equipment. The existing ETP is having physical separation of oil and grease by oil trapping system and silt sedimentation pit. The both STP and ETP final discharge water is being monitored on fortnightly once to ensure the final discharge water in line to approved CTO and record maintained for the same. The test results are very well within the norms. The latest monitoring report is enclosed here as table. **No – 13 and table. No 14.**
VIII. VII (B.P)	**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 program of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed**	Initial Medical Examination & Periodical Medical Examination is being carried out to all company & contractors employees on regular basis. The IME & PME is being carried as per in compliance to Mines Act 1952 & rules 1956 and amendments there to. During the reporting period (Oct 2018 to March 2019) project has carried out IME & PME for 18 employees. The IME & PME tests include PFT, X-Ray, and lung spirometer etc. A comprised summery report for IME & MPE during report period is enclosed as **Annexure – 09.**
IX. VIII (B.P)	**A separate environmental management cell with suitable qualified personnel should be setup under the control of a senior executive, who will report directly to the head of the organization**.	We have established an Environmental Cell headed by the General Manager to look after the implementation of the various pollution control measures and other Environment management System requirements. The detail of the Environment Cell structure is enclosed as

		ANNEXURE- 14.
X. IX (B.P)	**The funds earmarked for environmental protection measures should be kept in separate account and should not diverted or other proposes. Year wise expenditure should be reported to the Ministry and Regional Office located at Bhubaneswar.**	The funds earmarked for environmental Protection are being utilized for the same only. The same expenses details are mentioned in the **table no.-17**
XI. X (B.P)	**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 authorized and the date of start of land development work.**	We will abode the said condition.
XII. XI (B.P)	**The Regional Office of the Ministry located at Bhubaneswar shall monitor complains of the stipulated conditions. The project authorities should extend full co-operations to the officer (S) of the regional office by furnishing the requisite data / information/ monitoring reports.**	We are extending all our cooperation during inspections by the Authority.
XIII. XII (B.P)	**The project proponent shall submit six monthly reports under status of the implementation of the stipulated EC conditions including results of monitored data (both in hard copies as well as by e-mail) to the Ministry of Environmental and Forests, its regional Office, Bhubaneswar, the respective zonal offices of CPCB and the SPCB. The proponent shall upload the status of the EC conditions, including results of monitored data on their website and shall update the same periodically. It shall**	The Project is uploading the last six monthly EC Compliance reports in the website bearing address www.uimm-ip.comon regular basis. The details of submission of the six monthly compliance reports on the status of the implementation of the stipulated conditions are enclosed as **TABLE NO.-18.**

	simultaneously be sent to the Regional Office of the Ministry of Environment and Forests, Bhubaneswar, the respective Zonal Officer of CPCB and the SPCB.	
XIV. XIII (B.P)	**A copy of clearance latter shall be sent by the proponent to concerned Panchayat, Zila Parishad /Municipal Corporation, Urban local body and 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 web site of the company by the proponent.**	It has been complied with intimating the letters to local Gram Panchayat, Municipality, DDM Office, Zillah Parishad, Divisional Forest Officer etc. and a copy of environmental clearance letter also made available in the company's website i.e. www.uimm-ip.com.
XV. XIV (B.P)	**The State Pollution Control Board should display a copy of the clearance letter at the Regional office, District Industry Centre and Collector's office/ Tehsildar's Office for 30 days.**	It has been complied.
XVI. XV (B.P)	**The environment 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 EC conditions and shall also be sent the Regional Office of the Ministry of Environment and forests, at Bhubaneswar by e-mail.**	The Environmental statement in Form – V is being submitted regularly to the state pollution control board for the financial year. We are also uploading the annual environment statement along with the six monthly environmental compliance reports in the company website i.e. www.uimm-ip.com. The latest Form – V for the FY 2017-18 is submitted to the board, copy enclosed as **Annexure – 15**.
XVII. XVI	**The project authorities should advertise at least in two local**	The Project has already advertised for iron ore mining and iron ore beneficiation plant projects

(B.P)	**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.**	in two newspapers about the issuance of the environment clearance of the Project, one is advertised in the vernacular language of the locality concerned.

PHOTOS-1:

Photo showing check dams & Check weirs implementation within ML

Photo Showing varies Nallah protection measures under taken out side ML


Photos showing village harvesting pond developed in surrounding villages




Photo showing OB & sub grade dumps are provided with retention wall and other Mitigative measures.

PHOTOS -2:

Retaining wall provided at the toe end of the dump

PHOTOS -3:

PHOTOS SHOWING THE AVENUE PLANTITON AT KEONJAHR


Photos showing varies area plantation undertaken

PHOTOS -4:


Photos showing mobile water tankers encaged for dust suppression


Photos showing automatic fixed sprinkler installed at mines permanent Haul road

Photo showing motor grader under use for road maintenance

Photos showing dry fog implementations is varies plantation.

PHOTOS -5:

PHOTO SHOWING ROOF RAIN WATER HARVESTING SYSTEMS EMPLOYEE'S CAMP

Combined Six Monthly Compliance Status of Environmental Clearance Conditions – "Unchabali Iron and Manganese Ore Mines & Iron ore Beneficiation Plant of M/s Indrani Patnaik" located in village(s) Unchabali & Balda, Sub-division Champua, District Keonjhar, Orissa.

PHOTO SHOWING ROOF RAIN WATER HARVESTING SYSTEMS AT MINES & UNCHABALI DISPENSARY

PHOTOS – 6:

Photo Showing DP 1100 Hydraulic Drilling Machine equipped with dust extractor & wet drilling mechanism

PHOTOS -7:

PHOTO SHOWING ETP PLANT PROVIDED IN WORK SHOP SERVICE CENTER

PHOTOS SHOWING STP TECHNICAL STRUCTURE & EXISTING PLANT

PHOTOS – 8:

Photo Showing Electronic Display board placed in the mines entrance gate to display the Environmental parameters

TABLE – 1

SL.NO	Description	Dimensions/Capacity
1	Check Dam cum Settling pond -1	9800 CUM
2	Check Dam - 4	689 CUM
3	Check Dam - 5	2000 CUM

 # TABLE – 1 SHOWING CHECK DAM AND CHECK WEIR DETAILS IMPLEMENTED WITHIN THE ML AREA

TABLE-2

SL.NO	Description	Location	Dimensions/Capacity
1	Check Dam - 13	21^0 52' 41.96" N 85^0 25'41.97" E	15 M X 2 M X 1.5 M
2	Check Dam - 14	21^0 52' 42.88" N 85^0 25'50.81" E	15 M X 1.5 M X 1.5 M
3	Check Dam - 15	21^0 52' 36.75" N 85^0 25'58.75" E	10 M X 1.5 M X 1.5 M
4	Check Dam - 16	21^0 52' 35.55" N 85^0 25'59.51" E	12 M X 1.5M X 1.5 M
5	Guard Wall	21°52'41.14"N 85°25'54.05"E	300 M
6	Nallah Slope pitching	21°52'45.66"N 85°25'2.67"E	-
7	Plantation	21°52'41.59"N 85°25'53.87"E	150

 # TABLE – 2 SHOWING CHECK DAMS IMPLEMENTATION OUT SIDE THE ML

TABLE-3

SL.NO	DESCRIPTION	CAPACITY IN CUM
1	NAMIRA POND -1	8100
2	NAMIRA POND -2	92400
3	BELDA POND -1	13200
4	BELDA POND -2	43160

 # TABLE – 3 SHOWING IMPLEMENTED VILLAGE HARVESTING PONDS DETAILS

TABLE-4

Sl. No	Description of the dump	Location of the dump	Protections Measures
1.	Sub Grade	B-Block	12, 600 Sqr. Mtr of dump surface area covered with Geo textile applications.12000 Saplings are planned on the surface of the dump.450 RM meter retaining wall constructed with the size of 1.8 M x1.2 M.
2.	Over Burden - 2	Near Garage	4000 Sqr. Mtr of dump surface area covered with Geo textile applications.150 RM of retaining wall constructed with the size of 1.8 M x 1.2 M and followed with siltation pond, drainage water is connected to bottom check dams.
3.	Over Burden-1	Near Pillar No L2	300 Mtr retaining wall along with garland drainage is constructed with settling pit. 130 Mtr of Hume pipe drainage pattern has been constructed.

 # TABLE-4 SHOWING VARIES DUMP PROTECTIONS MEASURES IMPLEMENTATION

TABLE-5A

Plantation Details as on March_2019			
Sl. No	**Year**	**Number of Saplings**	**Survival Rate**
1	2018-2019	5860	85%
1	2017-2018	2450	90%
2	2016-2017	11865	86%
3	2015-2016	11960	85%
4	2014-2015	5980	80%
5	2013-2014	12550	70%
6	2012 - 2013	11000	80%
7	2011 - 2012	7830	70%
8	2010 - 2011	11086	65%
9	2009-2010	9922	20%

TABLE-5B

SL.NO	LOCATION	Description	2018-19	PLANTS TYPE
1	IN Side ML	Dump Safety Zone Mines bench	4410	Radha chuda, krishna chuda,cha kunda, saru cha kundha,karanja,siru tree, Arjuna
2				
4	OUT SIDE ML AREA	School Plantation & Avenue Plantion	650	Jack fruit, cherry, crusted apple, badam, mango
6		Nallah side	100	Mango, Neem, karanja

 # TABLE-5 SHOWING PLANTATION DETAILS

TABLE-6

SL. No.	Description	Unit	Quantity	Remarks
1	Automatic Fixed Sprinkler	R.M	2500	Dispatch Road and Permanente Haul Road
2	High Frequency mobile water Tanker	30 KL	1	Mines Benches, Stock yard, plant area, and other mines premises including Village Roads & Railway Sidings
3	High Frequency mobile water Tanker	25 KL	1	
4	Mobile water tanker	8 KL	2	
5	Mobile water Tanker	8 KL	3	

 # TABLE-6 SHOWING PRACTICE OF DUST SUPPRESSING ACTIVITIES

TABLE-7

SUMMARIZED AMBIENT AIR QUALITY MONITORING REPORT: UNCHABALI IRON & MN ORE MINING PROJECT OF SMT. INDRANI PATNAIK, DISTRICT; KEONJHAR, ORISSA.						
Period: Oct_2018 to March_2019						
	Month	**Quality Parameter, Results, micro.gm/CUM**				
		Range	PM10	PM2.5	SO_2	NO_x
AAQ-C1 – Mines Office (Core zone)	OCT-18	AVG	85.90	41.50	860	11.30
	NOV-18		84.70	41.20	9.0	12.20
	DEC-18		81.20	39.20	9.80	11.60
	JAN-19		85.30	41.50	12.10	14.20
	FEB-19		80.40	39.30	10.30	12.60
	MARCH-19		82.50	40.40	12.50	15.0
AAQ-C2 – Employees Camp (Core Zone)	OCT-18	AVG	64.10	30.20	6.50	8.50
	NOV-18		64.80	31.20	6.50	8.60
	DEC-18		65.40	31.10	9.0	10.90
	JAN-19		64.50	30.70	7.50	9.70
	FEB-19		67.40	32.0	7.30	9.50
	MARCH-19		66.00	32.20	7.60	9.30
AAQ-C3- Beneficiation plant (Core Zone)	OCT-18	AVG	78.30	35.60	8.10	10.80
	NOV-18		78.50	37.80	8.40	11.10
	DEC-18		77.90	37.10	9.90	11.50
	JAN-19		76.40	36.40	10.40	12.40
	FEB-19		75.20	35.90	9.90	12.30
	MARCH-19		75.60	37.10	9.60	12.50
AAQ-B2	OCT-18	AVG	64.8	30.9	6.70	9.40

Village Balda (Buffer Zone)	NOV-18		66.40	31.60	7.10	9.80
	DEC-18		67.70	32.80	8.10	10.10
	JAN-19		63.30	30.20	8.0	10.50
	FEB-19		71.10	33.10	8.40	10.80
	MARCH-19		69.30	33.80	10.20	12.70
AAQ-B3 Village Nayagarh (Buffer Zone)	OCT-18	AVG	73.0	34.70	7.80	10.60
	NOV-18		73.60	35.70	8.06	10.80
	DEC-18		74.70	35.70	8.80	10.80
	JAN-19		70.90	34.30	9.10	11.10
	FEB-19		76.10	36.10	10.30	12.50
	MARCH-19		72.70	35.30	8.70	11.60
AAQ-B1 Village Unchabali (Buffer Zone)	OCT-18	AVG	64.50	35.50	5.70	9.50
	NOV-18		63.30	35.30	6.30	10.40
	DEC-18		65.80	36.90	6.70	10.0
	JAN-19		65.0	30.60	7.40	9.60
	FEB-19		69.31	32.50	8.80	11.10
	MARCH-19		60.40	27.60	6.70	8.50

 # TABLE-7 SHOWING AAQ MONITORING REPORT FOR THE REPORTING PERIOD.

TABLE-8

Surface Water Flow Rate in CUM/SEC				
SL. No	**Monitoring Station**	**APRIL-2018**	**AUGUST-2018**	**SEPTEMBER-2018**
1	Baitarani river	4.95	11.25	2.0
2	Dalko Nallah	0.07	0.36	0.17
3	Jalpa Nallah	0.25	0.40	0.93
4	Kashi Nallah	0.03	0.09	0.04
5	Unchabali Nallah	0.04	0.08	0.12
6	Dalki Nallah	0.04	0.06	0.21
7	Ghairajal Nallah	0.08	0.09	0.16

Combined Six Monthly Compliance Status of Environmental Clearance Conditions – "Unchabali Iron and Manganese Ore Mines & Iron ore Beneficiation Plant of M/s Indrani Patnaik" located in village(s) Unchabali & Balda, Sub-division Champua, District Keonjhar, Orissa.

TABLE-9

Surface water Quality analysis report for the Period of Post Monsoon (November_2018)

SL.NO	DESCRIPTION	UNIT	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8	SW-9	SW-10
1	Colour (apparent)	Hazen	5	5	5	5	5	5	5	5	5	5
2	Odour	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	Taste		Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	8.13	5.85	6.49	4.90	1.74	4.02	3.14	5.58	0.87	2.78
5	pH	--	6.75	6.89	6.92	6.67	7.05	6.80	6.98	7.02	6.80	6.72
6	Electrical Conductivity (EC)	µS/cm	149.50	156.40	174.20	156.40	169.80	160.10	131.90	133.10	179.20	165.60
7	Total Suspended Solids (TSS)	mg/l	6.0	1.0	BDL	39.30	2.10	6.60	2.40	7.50	2.60	5.50
8	Total Dissolved Solids (TDS)	mg/l	118.0	110.0	126.0	112.0	125.0	114.0	97.0	100.0	134.0	136.0
9	Calcium Hardness as CaCO3	mg/l	53.0	44.60	49.0	49.0	57.10	61.20	49.0	49.0	57.10	61.20
10	Magnesium Hardness as CaCO3	mg/l	44.90	28.60	44.90	40.80	49.0	36.70	16.30	12.20	57.10	57.10
11	Total Alkalinity	mg/l	75.48	77.52	93.84	79.56	83.64	77.52	63.24	63.24	89.76	81.60
12	Total hardness	mg/l	97.92	73.44	93.84	89.76	106.08	97.92	65.28	61.20	114.24	118.32
14	Chloride as Cl-	mg/l	10.0	12.0	11.0	10.0	11.0	10.0	10.0	10.0	11.0	12.0
15	Residual Chlorine	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
16	Phenolic compound as C6H5OH	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17	Sulphate as SO4	mg/l	2.61	2.09	3.42	2.59	3.16	2.09	BDL	BDL	2.21	BDL
18	Nitrite-Nitrogen (NO2-N)	mg/l	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
19	Nitrate-Nitrogen (NO3-N)	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
20	Phosphate-P (PO4-P)	mg/l	4.53	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25

Combined Six Monthly Compliance Status of Environmental Clearance Conditions – "Unchabali Iron and Manganese Ore Mines & Iron ore Beneficiation Plant of M/s Indrani Patnaik" located in village(s) Unchabali & Balda, Sub-division Champua, District Keonjhar, Orissa.

21	Ammonical Nitrogen (NH4-N)	mg/l	0.58	0.87	0.58	0.58	0.58	0.50	0.58	0.87	1.15	0.87
22	Free Ammonia (NH3)	mg/l	0.16	0.13	0.13	0.13	0.15	0.13	0.13	0.14	0.12	0.14
23	Chemical Oxygen Demand (COD)	mg/l	10.60	8.50	12.80	8.50	12.80	8.50	12.80	12.80	10.60	8.50
24	Fluoride F-	mg/l	0.13	0.13	0.12	0.14	0.13	0.12	0.11	0.12	0.11	0.14
25	Sodium (Na)	mg/l	8.61	9.07	8.0	7.99	8.82	7.01	5.89	8.25	7.33	7.78
26	Potassium (K)	mg/l	1.28	1.49	1.25	1.67	1.42	1.08	1.08	1.14	1.01	1.44
27	Calcium as Ca2+	mg/l	26.26	17.99	19.62	19.62	22.89	24.53	19.62	19.62	22.89	24.53
28	Magnesium as Mg2+	mg/l	10.91	6.95	10.91	9.92	11.91	8.93	3.97	2.98	13.89	13.89
29	Iron (Fe)	mg/l	0.49	0.21	0.26	1.3	1.5	0.26	0.22	0.18	0.57	3.3
30	Copper (Cu)	mg/l	0.01	0.013	0.01	0.013	0.009	0.008	0.008	0.01	0.009	0.009
31	Manganese (Mn)	mg/l	0.09	0.29	0.08	0.28	0.16	0.18	0.06	0.19	0.11	0.18
32	Arsenic (As)	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
33	Lead (Pb)	mg/l	0.01	0.008	0.010	0.01	0.012	0.010	0.012	0.008	0.007	0.008
34	Zinc (Zn)	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.012
35	Hexavelent Chromium (Cr+6)	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
36	Chromium (Cr)	mg/l	<0.005	<0.005	<0.005	<0.005	0.09	<0.005	<0.005	<0.005	<0.005	<0.005
37	Mercury (Hg)	mg/l	<0.001	<0.001	<0.001	<0.006	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
38	Cadmium (Cd)	mg/l	0.013	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
39	Selenium (Se)	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
40	Aluminium (Al)	mg/l	0.33	0.090	0.038	1.16	0.18	0.17	0.09	0.14	0.036	0.23
41	Boron (B)	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
NOTE – *The monitoring and analysis has been carried by the SGS India Pvt Ltd, Jamshedpur.*												

Combined Six Monthly Compliance Status of Environmental Clearance Conditions – "Unchabali Iron and Manganese Ore Mines & Iron ore Beneficiation Plant of M/s Indrani Patnaik" located in village(s) Unchabali & Balda, Sub-division Champua, District Keonjhar, Orissa.

MONITORING STATION DETAILS

SL. No	Reference Code	Station Name	Source of Sample
1	SW -1	Baitarani U/S	River
2	SW -2	Baitarani D/S	River
3	SW – 3	Kashi Nallah	Nallah
4	SW – 4	Jalpa Nallah	Nallah
5	SW – 5	Gahirajala Nallah	Nallah
6	SW – 6	Mithila Spring	Spring
7	SW – 7	Dalko Nallah	Nallah
8	SW – 8	Dalki Nallah	Nallah
9	SW -9	Unchabali Nallah U/S	Nallah
10	SW - 10	Unchabali Nalla D/S	Nallah

Combined Six Monthly Compliance Status of Environmental Clearance Conditions – "Unchabali Iron and Manganese Ore Mines & Iron ore Beneficiation Plant of M/s Indrani Patnaik" located in village(s) Unchabali & Balda, Sub-division Champua, District Keonjhar, Orissa.

TABLE-10

Ground water Quality analysis report for the Period of Post Monsoon (November-2018)

SL.NO	DESCRIPTION	UNIT	GW-1	GW-2	GW-3	GW-4	GW-5	GW-6	GW-7	GW-8	GW-9	GW-10
1	Colour (apparent)	Hazen	5	5	5	5	5	5	5	5	5	5
2	Odour	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	Taste		Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	<0.10	0.37	0.58	0.52	114.0	<0.10	9.39	2.26	492	<0.10
5	pH	--	6.80	6.60	6.68	7.13	6.92	7.15	6.70	7.11	6.77	6.71
6	Electrical Conductivity (EC)	µS/cm	207	208	506	115.60	153.0	198.50	201	203	92.70	154.0
7	Total Suspended Solids (TSS)	mg/l	BDL	BDL	2.10	BDL	10.50	BDL	2.80	BDL	46.60	BDL
8	Total Dissolved Solids (TDS)	mg/l	147.0	149.0	360.0	84.0	120.0	137.0	140.0	143.0	72.0	154.0
9	Calcium Hardness as CaCO3	mg/l	68.0	84.0	112.0	6.81	12.65	14.9	12.65	14.59	6.81	14.59
10	Magnesium Hardness as CaCO3	mg/l	56.0	36.0	88.0	28.0	52.0	60.0	52.0	60.0	28.0	60.0
11	Total Alkalinity	mg/l	103.95	105.84	102.06	47.25	75.60	103.95	113.40	111.50	45.36	115.29
12	Total hardness	mg/l	124.	120.0	200.0	64.0	108.0	120.0	124.0	124.0	60.0	132.0
14	Chloride as Cl-	mg/l	9.78	2.94	41.09	9.78	6.85	9.78	5.87	7.83	6.36	10.76
15	Residual Chlorine	mg/l	<0.1	<0.1	<0.1	0.20	<0.1	0.20	<0.1	<0.1	<0.1	<0.1
16	Phenolic compound as C6H5OH	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17	Sulphate as SO4	mg/l	BDL	BDL	25.90	BDL	BDL	2.29	BDL	2.66	BDL	BDL
18	Nitrite-Nitrogen (NO2-N)	mg/l	BDL	0.06	0.03	0.03	0.02	BDL	0.06	0.09	0.05	0.07
19	Nitrate-Nitrogen (NO3-N)	mg/l	BDL	1.85	17.34	1.23	BDL	BDL	BDL	BDL	BDL	BDL
20	Phosphate-P (PO4-P)	mg/l	<0.25	<0.25	<0.25	<0.25	0.41	<0.25	0.31	<0.25	<0.25	<0.25

21	Ammonical Nitrogen (NH4-N)	mg/l	0.7	0.9	0.5	1.1	0.8	0.5	BDL	BDL	BDL	BDL
22	Free Ammonia (NH3)	mg/l	<5.0	0.9	<5.0	<5.0	<5.0	0.37	0.27	0.24	0.27	0.24
23	Chemical Oxygen Demand (COD)	mg/l	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	6.30	<5.0	6.30	<5.0
24	Fluoride F-	mg/l	0.18	0.19	0.12	BDL	0.12	0.20	BDL	0.12	BDL	0.18
25	Sodium (Na)	mg/l	7.19	8.52	19.65	3.62	4.60	5.96	3.30	5.03	2.77	6.82
26	Potassium (K)	mg/l	0.16	<0.10	4.94	0.24	<0.10	<0.10	0.27	<0.10	<0.10	<0.10
27	Calcium as Ca2+	mg/l	27.25	33.67	44.89	14.43	22.44	24.05	28.96	25.65	12.83	28.86
28	Magnesium as Mg2+	mg/l	13.62	8.76	21.40	6.81	12.65	14.59	12.65	14.59	6.81	14.59
29	Iron (Fe)	mg/l	0.261	0.215	<0.001	<0.001	0.550	0.016	0.529	<0.001	0.3	0.024
30	Copper (Cu)	mg/l	<0.005	0.062	<0.005	<0.005	<0.005	0.007	<0.005	<0.005	0.006	<0.005
31	Manganese (Mn)	mg/l	0.011	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.013	0.0057
32	Arsenic (As)	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
33	Lead (Pb)	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.015	<0.005
34	Zinc (Zn)	mg/l	<0.001	<0.001	<0.001	<0.001	0.021	<0.001	<0.001	<0.001	0.057	<0.001
35	Hexavelent Chromium (Cr+6)	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
36	Chromium (Cr)	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
37	Mercury (Hg)	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.081
38	Cadmium (Cd)	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
39	Selenium (Se)	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
40	Aluminium (Al)	mg/l	0.016	0.017	0.017	0.014	<0.01	0.014	0.022	<0.01	0.011	<0.01
41	Boron (B)	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

NOTE – *The monitoring and analysis has been carried by the SGS India Pvt Ltd, Jamshedpur.*

Combined Six monthly Compliance Status of Environmental Clearance Conditions – "Unchabali Iron and Manganese Ore Mines & Iron ore Beneficiation plant of M/s Indrani Patnaik" located in village(s) Unchabali & Balda, Sub-division Champua, District Keonjhar, Odisha.

MONITORING STATION DETAILS

SL.No	Reference Code	Station Name	Source of Sample
1	**GW - 1**	Malda Village	Tube Well
2	**GW – 2**	Balda Village	Tube Well
3	**GW – 3**	Janaganthpur Village	Tube Well
4	**GW – 4**	Unchabali Village	Tube Well
5	**GW – 5**	Camp (within ML)	Tube Well
6	**GW – 6**	Mines (within ML)	Tube Well
7	**GW – 7**	Gahirajala Village	Tube Well
8	**GW – 8**	Basantpur Village	Tube Well
9	**GW -9**	Nayagardh Village	Tube Well
10	**GW -10**	Pid-Pukhari Village	Tube Well

Combined Six monthly Compliance Status of Environmental Clearance Conditions – "Unchabali Iron and Manganese Ore Mines & Iron ore Beneficiation plant of M/s Indrani Patnaik" located in village(s) Unchabali & Balda, Sub-division Champua, District Keonjhar, Odisha.

Table-11

Monitoring Station	RL	Description	GWL (BGL in M)					
			Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	March -19
Inside ML area	510	Bore Well	1.3	1.80	2.0	2.10	2.20	1.90
Unchabali	504	Open Well	3.1	3.40	3.60	3.80	3.70	3.20
Kalimati	550	Open Well	3.4	3.60	3.50	3.70	3.60	3.40
Balda	568	Open Well	3.2	3.40	3.60	3.50	3.80	3.10
Malda	507	Bore Well	5.1	5.80	6.10	6.20	6.90	6.40
Nayagarh	504	Open Well	3.2	3.50	3.80	3.90	3.20	2.80

#TABLE NO. 1 SHOWING GROUND WATER LEVEL MONITORING DATA

TABLE-12

SL.NO	MONTH	Blasting Results in PPV	Norms for PPV
1	NOVEMBER – 18	4.75 mm/sec	5.00 mm /sec
2	DECEMBER – 18	2.21 mm/sec	5.00 mm /sec
3	JANUARY – 19	0.22 mm/sec	5.00 mm /sec

 # TABLE NO.-12 SHOWING PEAK PARTICLE VELOCITY REPORT

TABLE - 13

SL. NO	DESCRIPTION	Unit	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	March-19
1	**pH**	-	6.71	6.92	6.68	6.95	7.05	7.90
2	**Total Suspended Solids (TSS)**	Mg/l	35.75	15.50	38.75	29.70	46.95	41.85
3	**(BOD)**	Mg/l	25.40	8.90	22.70	27.40	26.10	12.50
NOTE – *The monitoring and analysis has been carried by the SGS India Pvt Ltd, Jamshedpur.*								

#TABLE NO.13 SHOWING SEWAGE WATER TREATMENT PLANT WATER DISCHARGE REPORT

TABLE – 14

SL .NO	DESCRIPTION	Unit	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	March-19
1	pH	-	6.73	6.83	7.12	7.12	7.14	7.70
2	Total Suspended Solids (TSS)	Mg/l	12.65	2.0	23.95	63.10	20.95	58.05
3	Oil & Grease	Mg/l	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
NOTE – *The monitoring and analysis has been carried by the SGS India Pvt Ltd, Jamshedpur.*								

#TABLE NO.14 SHOWING EFFULENT WATER TREATMENT PLANT WATER DISCHARGE REPORT

TABLE – 15

FUGITIVE EMISSION DUST MONITORING REPORT

Periods		MONITORING LOCATIONS					
		CRUSHER PLANT	WORK SHOP	HAUL ROAD	SCREEN PLANT	MINES FACE	DUMP AREA
		Results, micro.gm/CUM					
Oct – 18	AVG	876.42	755.05	677.94	840.33	657.08	758.33
Nov-18	AVG	786.01	506.16	505.32	799.96	678.89	653.58
Dec- 18	AVG	978.27	537.71	587.30	627.61	694.56	618.88
Jan-19	AVG	792.86	438.81	654.27	653.11	721.47	668.49
Feb-19	AVG	729.25	616.76	581.18	681.68	595.79	616.76
Mar-19	AVG	716.03	627.66	613.05	649.74	526.36	605.22
NOTE – *The monitoring and analysis has been carried by the SGS India Pvt Ltd, Jamshedpur.*							

 # TABLE NO.-15 SHOWING FUGITIVE EMISSION MONITORING REPORT

TABLE – 16

Sl. No.	Locations	NOISE LEVEL, Leq.in dB (A) from data log of monitor.					
		Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Work Zone Noise Report							
1	MINES PIT	67.38	68.28	70.30	70.20	58.18	62.34
2	LOADING POINT	58.22	65.19	68.52	68.80	52.13	60.10
3	OPERATOR CABIN	60.12	58.61	64.12	60.30	48.90	59.30
4	WORK SHOP	76.44	74.48	67.22	62.11	60.13	68.12
5	SCREEN PLANT	78.80	74.69	70.12	70.28	74.70	73.12
Ambient Noise Report							
1	BALDA	47.22	53.18	51.28	51.64	42.90	50.12
2	MALDA	45.16	51.16	49.34	51.68	44.38	51.20
3	NAYAGARH	40.23	54.20	52.26	52.00	40.40	49.23
4	UNCHABALI	48.30	52.28	48.12	49.78	43.16	47.50
5	OFFICE AREA	42.40	45.12	46.18	52.00	42.80	44.10
6	CAMP AREA	47.18	48.42	50.10	48.30	43.18	43.18
Norms		Residential. Leq: Day Time : 55 dB (A), Night Time : 45 dB (A)					
		Industrial, Leq: Day Time : 75 dB (A), Night Time : 70 dB (A)					
		Work-zone during 8 Hr exposure: 85 dB (A) – Leq.					

 # TABLE NO.-16 SHOWING NOISE MONITORING REPORT

Combined Six monthly Compliance Status of Environmental Clearance Conditions – "Unchabali Iron and Manganese Ore Mines & Iron ore Beneficiation plant of M/s Indrani Patnaik" located in village(s) Unchabali & Balda, Sub-division Champua, District Keonjhar, Odisha.

TABLE – 17

Sl. No	DESCRIPIITON	2016-17	2017-18	2018-19
Environmental Monitoring Parameter Testing charges				
1	AAQ, Ground Water, Surface Water, STP, ETP, Soil Test, Fugitive Test etc.	24.52	22.49	87.40
Dump Stabilization & Plantation				
2	Retaining wall, garland drain & its maintenance	11.6	6.00	5.00
3	Plantation, dump stabilization by coir matting	32.1	24.56	10.00
Dust Suppression				
4	Mobile Sprinkler	49.22	50.32	40.35
5	Fixed Sprinkler	10.3	13.10	0.80
6	Dry fog	2.35	1.20	0.50
Environmental Instruments and its maintenance & calibration				
7	RDS, Noise Meter, PPV Instruments etc.	2.5	1.25	1.30
8	ETP and its maintenance	5.12	1.80	1.20
9	STP and its maintenance	1.28	2.18	1.50
Miscellaneous Expenses				
10	Rain water harvesting and its maintenance	4	2.31	1.00
11	Occupational Health & Hygiene monitoring	1.75	6.62	1.60
12	Others (Including Nallah Protection measures)	7.55	3.95	2.0
Total		**152.29**	**135.78**	**152.65**

TABLE - 18

Sl. No.	PERIOD	DATE OF SUBMISSION
1.	April – 2018 to Sept – 2018	01.12.2018
2.	October -2017 to March-2018	28.06.2018
3.	April-2017 to September-2017	04.12.2017
4.	October -2016 to March-2017	09.06.2017
5.	April-2016 to September-2016	25.11.2016
6.	October-2015 to March-2016	12.05.2016
7.	April-2015 to September -2015	25.11.2015
8.	October -2014 to March -2015	22.06.2015
9.	April-2014 to September -2014	10.11.2014
10.	October -2013 to March - 2014	23.05.2014
11.	April - 2013 to September - 2013	25.11.2013
12.	October - 2012 to March - 2013	25.05.2013

#TABLE NO.-18 SHOWING EC COMPLIANCE SUBMISSION DETAILS