

BANDUHURANG OPENCAST MINE

**Compliance Status of Environmental Condition with respect to Banduhurang Opencast Mine of as on
September 2017**

Sl. No.	Specific conditions	Status of Compliance
i.	<i>The project proponent shall obtain Consent to Establish from the State Pollution Control Board and effectively implement all the conditions stipulated therein.</i>	Consent to Establish from the State Pollution Control Board has been obtained vide letter no.G-784 dated 28.03.2011. Status of compliance report of all the conditions stipulated therein is being submitted to JSPCB.
ii.	<i>The environmental clearance is subject to approval of the State Land use Department, Government of Jharkhand for diversion of agricultural land for non-agricultural use.</i>	District Land Acquisition Officer (DLAO), E. Singhbhum, Jharkhand has delivered the possession of land (agricultural land) of 305.2 acres area vide certificate dated 26.06.2005, 29.11.2007 & 17.07.2008 situated in Banduhurang and Kerwadundri villages in favor of Uranium Corporation of India Limited, for setting of Banduhurang uranium mine. In principle, agricultural land has been acquired for non-agricultural purpose.
iii.	<i>The environmental clearance is subject to grant of forestry clearance. The project proponent shall obtain requisite prior forestry clearance under the Forest (Conservation) Act, 1980 for working in the forest area.</i>	The Ministry of Environment & Forest, Government of India has granted the forestry clearance of 130 ha forest land vide letter no. 8-138/2003-FC dated 07.04.2005 for Banduhurang Uranium Project and Turamdih Plant under the Forest (Conservation) Act, 1980. For the expansion project, no forest land is required.
iv.	<i>The project proponent shall ensure that no natural watercourse and/or water resources shall be obstructed due to any mining operations.</i>	No natural watercourse and/or water resources are present in lease area.
v.	<i>The top soil should be stacked at earmarked site(s) only with adequate measures and it should not be kept unutilized for a period more than 3 years. The topsoil should be used for land reclamation and rehabilitation of mined out areas.</i>	The topsoil is stacked at earmarked site within mine premises to be used for reclamation & rehabilitation of waste dump. About 189893 m ³ of top soil has been used for progressive reclamation of waste dump slope.
vi.	<i>The over burden generated shall be stacked at earmarked dump site(s) only and it should not be kept active for long period of time. The maximum height of the dump shall not exceed 35m, in two terraces of 20m and 15m each, so that the overall slope of dump should not exceed 28 degree. The OB dump should</i>	The over burden generated is stacked at the earmarked site within mine lease area and slopes are being terraced. The maximum height of the dump is 35m with overall slope of dump of 28°. Progressive reclamation of slope of the dump is being done. Top soil has been used to reclaim the slope of dump and subsequently the growth of

	<p><i>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. Backfilling shall start from the year 2018 and the entire backfilled area should be reclaimed and rehabilitated by plantation. 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 and its Regional Office located at Bhubaneswar on six monthly basis.</i></p>	<p>natural vegetation has developed on it as shown in photograph. Plantation on top and slope of the reclaimed dump has been done. Slope has been stabilized and no erosion is observed in rainy season. Therefore use of geo textiles for stabilization of the dump is not envisaged. As the part of total proposed area for waste dump is not available, the same has been re-located within mining lease. Photograph of the stabilized slope is attached herewith.</p>
vii.	<p><i>Catch drains and siltation ponds of appropriate size shall be constructed around the mine working, soil, mineral and OB dumps to prevent run off of water and flow of sediments directly into the rivers. The water so collected should be utilized for watering the mine area, roads, green belt development etc. The drains should be regularly desilted particularly after monsoon and maintained properly.</i></p> <p><i>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 rivers 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.</i></p>	<p>About 2319 m garland drain around waste dump area has been constructed to collect the runoff water. Two number de-silting pond (<i>sedimentation pits</i>) of total capacity about 100000 m³ have been constructed at southern corner of the lease area. The run-off water from waste dump area is channeled to the de-silting pond. The collected water in the pond is being utilized for industrial purpose. Photograph showing the de-silting pond is attached herewith.</p>
viii.	<p><i>Dimension of the retaining wall at the toe of the dumps and OB benches within the mine to check run-off and siltation should be based on the rain fall data.</i></p>	<p>Run off water during rainy season from the waste dump area is channeled via garland drain to the de-silting pond. Rainfall data of the area has been considered for design and evaluation of run-off quantity.</p>
ix.	<p><i>Suitable embankment of proper</i></p>	<p>Flood water during rainy season is not expected as</p>

	<i>dimensions should be constructed to protect the area from flood water during rainy season.</i>	the average ground level (163 mRL) of the area is much higher than highest flood level (140 mRL). Therefore construction of embankment is not required for flood protection. Total 2553 m pucca drain has been constructed to divert the storm water during rainy season.
x.	<i>The project proponent shall develop effective emergency response procedure to ensure appropriate risk management measures in the public domain, if any, due to the project.</i>	As far as project is concerned, no risk is associated to public domain during mining operation. All activities are confined within mining lease only, hence risk in the public domain is insignificant. However we have emergency preparedness plan for eventuality, if any. Guidelines of DGMS & AERB are being followed.
xi.	<i>Plantation shall be raised in an area of 127.9ha including a 7.5m wide green belt in the safety zone around the mining lease, over burden dump site, backfilled area, roads etc. by planting the native species in consultation with the local DFO/Agriculture Department. The density of the trees should be around 2500 plants per ha.</i>	Progressive greenbelt/ tree plantation is continued. Total 40225 tree plantation has been done up to March 2017 covering about 35.5 ha area.
xii.	<i>Regular water sprinkling should be carried out in critical areas prone to air pollution and having high levels of SPM and RPM such as haul road, loading and unloading points, transfer points and other vulnerable areas. It should be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard</i>	Regular sprinkling of water on haul road and dust prone area is done. RCC haul road of length about 2150 m has been constructed for ore transportation. Ambient air quality monitored during April to September 2017 at four locations in core zone & buffer zone in terms of PM ₁₀ , PM _{2.5} , SO ₂ , NO _x , Pb and Ni parameters are found within the permissible standards.
xiii.	<i>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</i>	Rainwater water harvesting ponds of total capacity 100000 m ³ have been constructed. Rain water from the waste dump area and mining pit is channeled via garland drain & collected in desilting cum rain water harvesting pond. Desilted water is being utilized for industrial purpose within mine premises. Pumping arrangement has been made to transfer the excess desilted water from Banduhurang Mine to UCIL's nearby Ore Processing Plant at Turamdih. Map showing rainwater harvesting cum desilting pond has been submitted.
xiv.	<i>Regular monitoring of ground water</i>	Regularly monitoring of ground water level of the

	<i>level and quality should be carried out in and around the mine lease by establishing a network of existing wells and constructing new piezometers during the mining operation. 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 Ministry of Environment and Forests and its Regional Office, Bhubaneswar, Central Ground Water Authority and Regional Director, Central Ground Water Board.</i>	existing well around the project is done. Ground water levels from the existing ground during April & August 2017 vary as 0.51 m to 10.56 m and 0.38 m to 6.80 m respectively. The water quality from two locations in terms of pH, Total Dissolved Solid, Turbidity, Chloride, Sulphate, Total Hardness as CaCO ₃ , Total Alkalinity, Nitrate Nitrogen, Calcium, Magnesium, Nitrate, Cadmium, Chromium, Copper, Manganese and Zinc meet the drinking water quality as per IS:10500 except Aluminum and Iron. Uranium and Radium values in 6 ground water samples during April & July 2017 varies from 0.5-2.5 µg/l & 10-86 mBq/l respectively which are well within drinking water standards (U- 60 µg/l and ²²⁶ Ra -300 mBq/l). Monitoring of ground water level and quality is regularly sent to the Regional Director, Central Ground Water Board, Patna (ref: UCIL/ENV/BND/CGWB/03/17 dated 18.05.2017).
xv.	<i>The project authorities should obtain prior approval of the competent authority for drawl of surface water and ground water, if any, required for the project.</i>	No groundwater withdrawal has been planned at Banduhurang mine. Mine discharge water is being used for industrial activities e.g. dust suppression, drilling, washing etc. Water supply network of adjacent Turamdih establishment of UCIL is used for drinking water supply to Banduhurang Mine. Agreement has been made with Water Resource Department, Govt. of Jharkhand and UCIL for withdrawal of surface water from Kharkhai river @12000 m ³ /d for Turamdih establishment which is sufficient for the above requirement.
xvi.	<i>The project proponent shall submit data generated on pre-project community health status within a radius of 1km of this mine to this Ministry and its Regional Office Bhubaneswar, within three months.</i>	Pre-project community health status report with respect to the existing capacity has been submitted vide our letter no. UCIL/ENV/BND/20/09 dated 20.05.2009.
xvii.	<i>The 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.</i>	Not applicable as mineral handling plant is not envisaged. Ore mined from Banduhurang Mine is being processed at nearby Ore Processing Plant at Turamdih.
xviii.	<i>Consent to operate should be obtained</i>	Consent to operate has been obtained from JSPCB

	<i>from SPCB before starting enhanced production from the mine.</i>	vide no. JSPCB/HO/RNC/CTO-865822/2017/1078 dated 31.07.2017 which is valid till 30.06.2021.
xix.	<i>Vehicular emissions should be kept under control and regularly monitored. Measures shall be taken for maintenance of vehicles used in mining operations and in transportation of mineral. Overloading of trucks should be avoided to stop spillage. The loaded trucks should be covered with tarpaulin sheets to prevent spillage of ore.</i>	Vehicular emissions are monitored regularly and maintenance of vehicles is practiced. Overloading of trucks is avoided to prevent the spillage. Transportation of ore from Banduhurang Mine to adjacent ore processing plant at Turamdih don't pass through public domain. PUC is attached herewith.
xx.	<i>Digital processing of the entire lease area using remote sensing technique should be done regularly once in three years for monitoring land use pattern and report submitted to Ministry of Environment and Forests and its Regional Office, Bhubaneswar.</i>	Digital processing of entire mine lease area using remote sensing technique has been submitted to the ministry. Updated high resolution digital processing map of lease area using remote sensing technique will be submitted after completion of job. High resolution data has been acquired from National Remote Sensing Centre, Hyderabad.
xxi.	<i>The project proponent should take all precautionary measures during mining operation for conservation and protection of endangered fauna such as giant squirrel, Indian elephant, pangolin, sloth bear, python etc. spotted in the study area in consultation with the concerned forest officials. Action plan so prepared for conservation of flora and fauna shall be 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 shall be submitted to the Ministry of Environment and Forests and its Regional Office, Bhubaneswar within 3 months</i>	Endangered fauna are not spotted in the lease area. Authentication for schedule-I fauna from Divisional Forest Officer has been obtained. UCIL has submitted the action plan for conservation of endangered fauna, if spotted in the area, to the ministry vide letter dated 08.08.2008.
xxii.	<i>Monitoring of background radiation levels in water, soil and ambient air should be carried out periodically in the study area (core and buffer zone) of the project.</i>	Monitoring of background radiation levels in water & ambient air (Gamma Radiation Survey) is carried out by Health Physics Unit of BARC in core & buffer zone of the project. Water analysis report has been furnished in condition no. XIV. The environmental Gamma radiation survey conducted during April to September 2017 in core & buffer zone shows variation from 0.14 to 1.98 $\mu\text{Gy/hr}$ & 0.06 to 0.38 $\mu\text{Gy/hr}$ respectively.
xxiii.	<i>The plants growing in the area, soil invertebrate animals and local</i>	Radiochemical analysis of the plants, aquatic vegetation & agricultural produce, growing in the

	<i>agricultural produce should be analyzed to check the build up of radioactivity levels, if any.</i>	area has been done. Results have been submitted vide our letter no. UCIL/ENV/BND/MoEF/20/09 dated 20.05.2009.
xxiv.	<i>Discharges from the treatment plant and settling pits should be constantly monitored for concentration of radio nuclides.</i>	Treatment plant at Banduhurang is not envisaged. Water from de-settling pond is used for industrial purpose within mine premises. The surplus water is sent to the nearby Turamdih ore processing plant for reuse. No water is discharged to environment due to mining operation.
xxv.	<i>Sludge from the treatment plant and settling pit should be transported to the tailing pond of Turamdih Ore Processing Plant in safe containment.</i>	Sludge from de-settling tank shall be contained in tailings pond of Turamdih plant.
xxvi.	<i>The project proponent shall have an emergency response plan to ensure that all potentially affected people understand the possible causes and consequences of radiation and other project related activities.</i>	Banduhurang is an opencast mine of very low grade of uranium ore. Mining of such a low grade ore, radiological emergency doesn't arise. However, for the radiological surveillance, Health Physics Unit of BARC monitors the various parameters around the project on periodical basis. Atomic Energy Regulatory Board (AERB) periodically reviews the observations
xxvii.	<i>Land oustees and land losers shall be compensated as per the National Policy on Resettlement and Rehabilitation of project Affected Families (NPRR), 2003/State Government norms.</i>	Private land of 305.2 acres has been acquired for Banduhurang Mining project. Total amount of compensation paid is Rs. 3,65,69,533.00 and 385 employments have been provided upto year 2011.
xxviii.	<i>Wet drilling and water spraying on muck should be practiced to reduce generation of silica and low level of radioactivity in the work place. The external radiation dose should be monitored quarterly to ensure that workers engaged in the work place are not over exposed.</i>	Wet drilling & water spraying on working area, waste dump and haul road is practiced to reduce the fugitive dust. The external radiation dose rates values from 45 locations of the work place during April to September 2017 show that it vary from 0.14 to 1.98 $\mu\text{Gy/hr}$ (Permissible value 8 $\mu\text{Gy/hr}$).
xxix.	<i>Blasting operation should be carried out only during the daytime. Controlled blasting should be practiced. The mitigative measures for control of ground vibrations and to arrest fly rocks and boulders should be implemented.</i>	Blasting operation is carried out in day time only. All the measures are taken to control the blast parameters in consultation with CMRI & DGMS.
xxx.	<i>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.</i>	A Final Mine Closure Plan will be submitted to MoEF before 5 years of mine closure.

Sl. No.	General Conditions	Status of Compliance
I.	<i>No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment and Forests.</i>	No change in mining technology & scope of working has been made without prior approval of the Ministry of Environment & Forest.
II.	<i>No change in the calendar plan including excavation, quantum of mineral uranium ore and waste should be made</i>	No change in the calendar plan including excavation and quantum of mineral has been made.
III.	<i>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, NO_x and CO monitoring. Location of the stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board. Data on ambient air quality (RPM, SPM, SO₂, NO_x and CO) should be regularly submitted to the Ministry including its Regional Office at Bhubaneswar and to the State Pollution Control Board/Central Pollution Control Board once in six months.</i>	Ambient air quality monitored during April to September 2017 at three locations in core and buffer zones in terms of PM ₁₀ , PM _{2.5} , SO ₂ , NO _x , Pb and Ni parameters are found within the permissible standards.
IV.	<i>Fugitive dust emission from all the sources be controlled regularly mentioned and data recorded properly. Water spraying arrangements of haul roads, wagon loading, dumps loading & unloading points should be provided and properly maintained.</i>	Fugitive dust emission is controlled by wet operation of drilling with dust extraction system and water spraying arrangement on haul roads, loading & unloading points. Water tankers with water sprinkling arrangement are used. Respirable dust was monitored in work zone during April to September 2017 which varies from 0.09 to 0.74 mg/m ³ . The values are within the permissible limits (0.8 mg/m ³).
V.	<i>Adequate measures should be taken for control of noise levels within prescribed standards. Workers engaged in blasting and drilling operations of HEMM, etc., should be provided with ear plugs/muffs.</i>	Personnel protective equipment (ear muffs/plug) is provided to workers. HEMM is equipped with glass enclosure cabin for operator to reduce the noise impact during operation. Noise levels vary from 42 to 70 db (A) which is within the permissible limits.
VI.	<i>Industrial wastewater (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 effluents from workshop</i>	Mine water discharge during mining operation is collected in de-silting pond. De-silted water is sent to Turamdih processing plant for treatment and reuse. No discharge of industrial wastewater is done from the mine.

VII.	<i>Acid mine water, if any has to be treated and disposed of after confirming to the standard prescribed by the competent authority</i>	Not applicable.
VIII.	<i>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 radioactive mineral dust and take corrective measures, if needed. The same programme may be extended to adjoining villages also.</i>	<p>Personnel working in dusty area are provided with PPE. Use of PPE is monitored. Vocational Training Officer (VTO) conducts various programs e.g. initial, refresher, special & development trainings on occupational health & safety and other topics as per the certified schedule of DGMS.</p> <p>Occupational health surveillance:</p> <ol style="list-style-type: none"> 1. Pre employment medical examination for lung function, x-ray, & audiometric test, pathological test, ECG & physical tests. 2. Periodical medical examination of all employees. 3. Medical facility is provided for all employees and their dependent. 4. Medical teams visit surrounding villages periodically and medicines are supplied free of cost. <p>During April to September 2017, total 224 employees were given vocational training from mine.</p>
IX.	<i>Environmental laboratory should be established with adequate number and type if pollution monitoring and analysis equipment in consultation with the State Pollution Control Board.</i>	Environmental engineering laboratory has been set up at Turamdih to cater the need of UCIL's operation in Jharkhand. Apart from this, Environmental Surveillance Laboratory of Bhabha Atomic Research Centre at Turamdih has started functioning for environmental and radiological monitoring.
X.	<i>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.</i>	Environmental Engineering Cell (EEC) has been set up. EEC is under direct supervision of General Manager who report to the head of the organization.
XI.	<i>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.</i>	Fund for environmental protection measure is made available. Rs. 3.5 crore had been incurred for water management system including construction of de-silting ponds and drainage. About Rs. 78 lakh has been incurred for laying of pipeline from de-silting pond to ore processing plant of Turamdih for reuse of mine discharge water. Recurring cost for environmental protection is Rs. 5 lakh /annum
XII.	<i>The project authorities should inform to the Regional Office located at Bhubaneswar regarding date of</i>	The competent authority has approved the financial sanction for capacity enhancement. Land development work for enhancement of production is

	<i>financial closures and final approval of the project by the concerned authorities and the date of start of land development work.</i>	not applicable as no additional land has been envisaged. Only rate of production of the existing mine will be enhanced.
XIII.	<i>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.</i>	Uranium Corporation of India Ltd. is committed to take action of any requirement/suggestion of the Ministry for safeguard of environment. We have extended our full cooperation to officials of Regional Office of MoEF, Bhubneswar during site visit held on 8 th to 9 th January 2014.
XIV.	<i>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.</i>	Being Complied.
XV.	<i>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 Bhubaneswar.</i>	UCIL had advertised in two local newspapers widely circulated on 18.05.2008.



Photograph of the stabilized waste dump slope



Photograph showing the de-silting pond