

URANIUM CORPORATION OF INDIA LIMITED
Status of Environmental Compliance of the Mohuldih Mine as on March 2014
(MoEF No. No. J-11015/259/2006-IA.II (M), dated 30th March 2007)

A. Specific conditions

- (i) *The environmental clearance is subject to approval of the State Landuse Department, Government of Jharkhand for diversion of agricultural land for non-agricultural use.*

The competent authority has delivered the possession of raity land (agriculture land) of 22.10 acres dated 25.01.2008 in favor of Uranium Corporation of India Limited for setting of Mohuldih Mine. In principle, agriculture land has been acquired for non-agricultural purpose through competent authority. Certificate of possession has been submitted to the ministry.

- (ii) *The environmental clearance is subject to grant of forestry clearance for diversion of 44.60 ha forestland. Necessary forestry clearance under the Forest (Conservation) Act, 1980 for an area of 44.60 ha forestland shall be obtained before starting mining operation in that area.*

Forestry clearance, under the Forest (Conservation) Act, 1980 has been obtained vide letter no. 8-58/2007-FC dated 01st July 2010 for 44.60 ha forestland.

- (iii) *All the conditions stipulated by the SPCB in their NOC shall be effectively implemented.*

NOC has obtained from JSPCB vide no. JA/2655/W/N-147 dated 04.08.2006. Compliance report has been submitted to the JSPCB vide letter no. UCIL/ENV/MHLD/SPCB/19/2008 dated 01.04.2008.

- (iv) *Top soil, if any, should be stacked with proper slope at earmarked site(s) only with adequate measures and should be used for reclamation and rehabilitation of mined out areas.*

As Mohuldih Mine is an underground mining project, availability of top soil is negligible. Small quantity of top soil available during construction of decline was used within mine premises.

- (v) *The over burden shall be stacked at earmarked dump site(s) only and should not be kept active for long period. Proper terracing of OB dump should be carried out so that the overall slope shall not exceed 28 degree. The OB dumps should be scientifically vegetated with suitable native species to prevent erosion and surface run off. 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, Bhubaneswar on six monthly basis.*

As the project is an underground mine, the over burden is not available. However during development period of mine, the generated waste rock is stacked at identified location, earmarked for waste dumping within premises. After development period is over, the waste rock generated during mining activity will be used to fill the mine voids in underground workings. Progressive reclamation of waste dump shall be done.

- (vi) *Catch drains and siltation ponds of appropriate size should be constructed for the working pit and OB dump to arrest flow of silt and sediment. The water so collected should be utilized for watering the mine area, roads, greenbelt development etc. The drains should be regularly desilted, particularly after monsoon, and maintained properly.*

Garland drain (size, gradient and length) shall be constructed for both mine pit and OB dump 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.

OB dump and mine pit are not applicable in the present context due to underground mining project. However, small waste dump at surface has been proposed within premises. Garland drain is under construction to arrest the silt and sediments from the waste dump area during rainy season which ultimately merge to desilting pond. Construction of de-silting pond of phase I & II have been completed.

- (vii) *Dimension of the retaining wall at the toe of the dump and OB benches within the mine to check run-off and siltation should be based on the rain fall data.*

Not applicable as explained above.

- (viii) *Regular monitoring of subsidence movement on the surface over working area and impact on water bodies/ vegetation/ structures/ surrounding should be continued till movement ceases completely. In case of observation of any high rate of subsidence movement, appropriate measures should be taken to avoid loss of life and material. Cracks should be effectively plugged with ballast and clayey soil /suitable material.*

As cut and fill method of mining is practiced for Mohuldih mining project, subsidence is not envisaged. The voids created during mining activities are filled up with waste rock and sand. The same practice has been adopted for nearby underground mines of UCIL. Subsidence has not been observed during mining operation.

- (ix) *The project authorities should check the possibility of existence of fault(s) before deciding about the thickness of safe barrier required to be maintained between the working face and the river in consultation with the Director General Mines & Safety (DGMS). De-pillaring should also be carried out after taking prior approval of the DGMS.*

No river exists within core zone of the project. Necessary approval for mining is taken from the DGMS.

- (x) *Study report on subsidence and stage wise development plan starting from 5th year of operation till the end of the mine at an interval of 5 years should be submitted to the Ministry and its Regional Office, Bhubneshwar within six months.*

As explained in sr. no. (viii), subsidence is not envisaged. However, study will be conducted on subsidence, if any. As per the approved mine plan, which has been submitted to the ministry, following development has been proposed at the end of 5th year of mine operation:

Main shaft	: Approx 200 m depth will be completed
Drift at 125 mRL	: 450 m
Drive at 100 mRL	: 600 m
Two ventilation shaft	: likely to be completed
Development of decline	: Upto 1200 m length

Mine plan after at the interval of 5th year of operation till the end of mine will be submitted.

- (xi) *All the mine entries should be above the highest flood level to avoid any anticipated flooding of mine from surface water during rainy season.*

All mine entries has been kept above the highest flood level (140 mRL).

- (xii) *In areas where subsidence is anticipated in shallow uranium ore occurrence, such areas be identified and provided with garland drains to ensure draining of water and avoid ingress of the same in to the underground mine.*

Subsidence is not envisaged as explained in sr. no. (viii). Necessary action has been taken to avoid ingress of water into the underground mine, if any. Garland drain has been constructed to divert the rain water around the mine entry.

- (xiii) *Suitable embankment of proper dimensions should be constructed to protect the area from flood water during rainy season.*

The profile of the area is hilly therefore flooding of mining area is not envisaged. Proper drainage system has been constructed to divert rainwater of the catchments area. Embankment may not be required for such purpose. Construction of storm water drain around the installation has been completed.

- (xiv) *Green belt should be raised in an area of 24.01 ha by planting the native species around the ML area, OB dump sites, roads etc. in consultation with the local DFO/Agriculture Department. The density of the trees should be around 2500 plants per ha.*

Progressive greenbelt development / plantation have started in vacant areas, around installation, along the roads and along the boundary. Total 17000 of native tree plantation has been completed till year 2014 which covers about 16.33 ha area. About 4000 tree plantation shall be done during monsoon season 2014.

- (xv) *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.*

Rainwater harvesting scheme shall be implemented as conservation measure to augment ground water resources. At present the runoff water from hill slope of north side of the project has been diverted to the existing pond. Major portion of runoff water from hilly area is collected in the pond.

- (xvi) *Regular monitoring of ground water level and quality should be carried out 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 , its Regional Office, Bhubaneswar, Central Ground Water Authority and Regional Director, Central Ground Water Board.*

Monitoring of ground water level is carried out around the project by network of existing wells and two newly installed piezometers. Water levels from the existing ground during November 2013 and January 2014 varies as 1.94 to 6.15 m and 3.10 to 8.60 m respectively. The ground water quality from five locations in terms of pH, Total Dissolved Solid, Turbidity, Chloride, Sulphate, Total Hardness as CaCO₃, Total Alkalinity, Nitrate Nitrogen, Calcium, Magnesium, Nitrate and heavy metals (Cu, Fe, Mn, Pb, Zn) meets the drinking water quality as per IS:10500. Uranium and radium values in 13 samples during January 2014 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/MHLD/CGWB/02/14 dated 27.02.2014).

(xvii) The project authorities should obtain prior approval of the competent authority for drawal of groundwater required for the project.

No groundwater withdrawal has been planned for industrial purpose except drinking and pit head bath. Mine discharge water is used for industrial purpose.

(xviii) The project authorities should undertake sample survey to generate data on pre-project community health status within a radius of 1km from proposed mine.

Pre-project community health survey report has been submitted to the ministry vide letter no. UCIL/ENV/MHLD/MoEF/12/10 dated 26.11.2010.

(xix) 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.

Not applicable. No mineral handling plant is envisaged.

(xx) Consent to operate should be obtained from SPCB before starting mining activities.

Consent to operate has obtained from JSPCB vide letter no. JA/3160/3161/AW dated 20.07.2010.

(xxi) 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 be covered with tarpaulin sheets to prevent spillage of ore.

Presently transportation of ore has not been started. Adequate measure shall be taken for vehicle maintenance to control emissions during transportation. Cover truck shall be used and overloading shall be avoided to prevent the spillages during transportation.

(xxii) The project proponent should take all precautionary measures during mining operation for conservation and protection of endangered fauna such as elephant etc. spotted in the study area in consultation with the concerned forest officials. Action plan for conservation of flora and fauna shall be prepared and implemented in consultation with the State Forest and Wildlife Department. Necessary allocation of funds for implementation of the conservation plan shall be made and the funds so allocated shall be included in the project cost. Copy of action plan may be submitted to the Ministry and its Regional Office, within 3 months.

No endangered fauna has been spotted in area. UCIL has submitted the action plan for conservation of fauna, if any to the MoEF vide our letter no. UCIL/NWP/ENV/MoEF/5/08 dated 12.05.2006. Report of DFO, Seraikela Forest Division regarding occurrence of schedule-I fauna within 10 km radius of the project has been submitted to the ministry.

(xxiii) 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.

Monitoring of background radiation levels in water, soil & ambient air (Gamma Radiation Survey) is carried out by Health Physics Unit of BARC in core & buffer zones of the project. Water analysis report has been furnished in condition no. XVI. Soil analysis of 8 sample from adjoining area of the mine for U (Nat), Ra-226, Po-210 and Th-(α) revealed that values are within natural variation of this background. The environmental Gamma radiation survey conducted during March 2014 in core & buffer zone shows the variation as 0.05 to 0.16 μ Gy/hr.

(xxiv) The plants growing in the area, soil invertebrate animals and local agricultural produce should be analysed to check the build up of radioactivity levels, if any.

This has been taken under R & D project. Results will be submitted.

(xxv) Discharges from the treatment plant and settling pits should be constantly monitored for concentration of radio nuclides.

Mine discharge water is collected in de-silting pond. After silt removal, water is reused for industrial purpose. The excess mine discharge shall be transferred to the nearby Turamdih mill for reuse. Construction of de-silting ponds and laying of pipeline has been completed.

(xxvi) Sludge from the treatment plant and settling pit should be transported in safe containment.

Sludge from de-silting tank will be transported to tailing pond of nearby Turamdih ore processing plant of UCIL. Sludge treatment plant is not envisaged as Mohuldih project will not have treatment facility within premises except desilting.

(xxvii) Land oustees and land losers should be compensated as per the State Government norms.

A compensation amount of Rs. 88,734,45/- has been paid to land loser against 24.15 ac of land for mine facility and road. Total 105 employments have been provided.

- (xxviii) *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.*

Wet drilling is practiced during mine development activities. Dust, alpha activity and external radiation dose is monitored in the work place by HPU of BARC. The respirable siliceous dust & alpha activity values from 12 locations of the work place during October 2013 to March 2014 varies from 0.42 to 0.61 mg/m³ (permissible value 0.80 mg/m³) & 16 to 56 mBq/m³ (permissible limit 150 mBq/m³) respectively. The external gamma dose rate values from 12 locations vary from 0.12 to 1.89 µGy/h (permissible limit: 8 µGy/h).

- (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.*

A final mine closer plan will be submitted to MoEF before 5 years of mine closer.

B. General Conditions

- (i) *No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment and Forests.*

No change in mining technology & scope of working shall be made without prior approval of the Ministry of Environment & Forest.

- (ii) *No change in the calendar plan including excavation, quantum of mineral uranium and waste should be made.*

No change in the calendar plan including excavation and quantum of mineral shall be made.

- (iii) *At least four ambient air quality monitoring stations should be established in the core zone as well as in the buffer zone for 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.*

Ambient air quality monitored during October 2013 to March 2014 at three locations in core and buffer zones in terms of PM10, PM2.5, SO2, NOx, Pb and Ni parameters are found within the permissible standards. Monitoring report has been submitted to MoEF.

- (iv) *Adequate measures should be taken for control of noise levels within prescribed standards. Workers engaged in blasting and drilling operations, operations of HEMM, etc., should be provided with ear plugs /muffs.*

Personnel protective equipment (ear muffs/plug) is provided to workers engaged in blasting & drilling operations. Noise level is monitored periodically which vary from 42 to 62 dB(A). Values are within permissible limits (75 dB(A)).

- (v) *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.*

Mine water discharge during mining operation is collected in de-silting tank. De-silted water is used for industrial purpose within premises and excess water, if any, will be pumped to Turamdih for reuse at processing plant. Oil and grease has been constructed at vehicle maintenance area.

- (vi) *Personnel working in dusty areas should wear protective respiratory devices and they should also be provided with adequate training and information on safety and health aspects.*

Occupational health surveillance programme of the workers should be undertaken periodically to observe any contractions due to exposure to radioactive mineral dust and take corrective measures, if needed. The same programme may be extended to adjoining villages also.

PPE is provided to workers. Vocational Training Officer conducts various training programs e.g. initial, refresher, special & development trainings on occupational health & safety and other topics as per the certified schedule of DGMS. Pre employment medical checkup is done. Workers engaged in mine are being monitored periodically for occupational health as per AERB guideline. During 2013, total 60 employees were medically examined and 62 were imparted vocational training from mine.

- (vii) *A separate environmental management cell with suitable qualified personnel should be set up under the control of a senior Executive, who will report directly to the Head of the organization.*

Environmental Engineering Cell (EEC) has been set up at Turamdih. Environmental monitoring for Mohuldih mining project is undertaken by EEC which is under direct supervision of General Manager (Safety, Environment and Training), who report to head of the organization. The following manpower is available at EEC:

Shri R. K. Mishra, Superintendent (Env. Engg)
Shri Ashok Kumar Shaw, FM (Environment)
Shri Pijush Kumar Paul, FM (Environment)
Jagdish Kumar Das, GOT (Environment)
Shri Aditya Kumar, Lab Assistant
Shri Bholenath Gorai, Helper "B"
Shri Pandu Ram Bari, Helper "A"

Note: One environmental engineer and one GOT will be added in above list during 2014.

- (viii) *The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purposes. Year-wise expenditure should be reported to the Regional Office, Bhubaneswar of the MoEF and to the ministry.*

Fund for environmental protection measure is made available. Expenditure incurred for construction of desilting pond and pipeline from Mohuldih Mine to Ore Processing Plant Turamdih is about Rs. 115 lakh.

- (ix) *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.*

Uranium Corporation of India Ltd. is committed to take action of any requirement/suggestion of the Ministry for safeguard of environment. We are extending our full cooperation to officials of Regional Office of MoEF, Bhubneshwar.

- (x) *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, Bhubaneshwar, Central Pollution Control Board and State Pollution Control Board.*

Six monthly compliance report is being sent to MoEF & JSPCB on regular basis.

- (xi) *A copy of the clearance letter will be marked to concerned Panchayat / local NGO, if any, from whom suggestions / representation has been received while processing the proposal.*

Not applicable.

- (xii) *The project authorities should inform to the Regional Office located at Bhubaneswar regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.*

Project has been approved by the competent authority. Land development has been started on 29.05.2007.

- (xiii) *State Pollution Control Board should display a copy of the clearance letter at the Regional office, District Industry Centre and Collector's / Tehsildar's Office for 30 days.*

Complied with State Pollution Control Board, Ranchi.

- (xiv) *The project authorities should advertise at least in two local newspapers widely circulated, one of which shall be in the vernacular language of the locality concerned, within 7 days of the issue of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and also at web site of the Ministry of Environment and Forests at <http://envfor.nic.in> and a copy of the same should be forwarded to the Regional Office of this Ministry located Bhubaneswar.*

UCIL had advertised in local newspaper namely Uditvani & Dainik Jagran on 06.04.2008 which is widely circulated in the region.