

URANIUM CORPORATION OF INDIA LIMITED

Status of Environmental Compliance of the Bagjata Mine as on March 2014 (MoEF No. No. J-11015/1/2005-IA.II (M), dated 30th March 2005)

A. Specific Conditions

- (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.*

District land acquisition officer (DLAO), East Singhbhum Jharkhand has delivered the possession of land in favor of Uranium Corporation of India Limited (UCIL) for setting of Bagjata uranium mines. In principle, private (agriculture) land has been acquired for non agricultural purpose. Certificate of possession has been submitted to the ministry.

- (ii) *Top soil 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 Bagjata Mine is an underground mining project, availability of top soil is negligible. During construction of shaft and decline a small quantity of soil had been excavated, which was used for reclamation of land for plantation in the mine premises.

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

Levels of the mine entries, vertical shaft and decline have been kept at 114.60 m RL and 104.67 m RL respectively which are above the highest flood level of 101.633 m RL.

- (iv) *Proper terracing of waste dump should be carried out so that the overall slope will come down to 28 degree. After completion of the development of the mine all waste rock generated should be backfilled to the mine void. Monitoring and management of rehabilitation areas should continue until the vegetation becomes self-sustaining. Compliance status should be submitted to the Ministry of Environment & Forests on yearly basis.*

Waste rock generated during mining activity has been stacked at earmarked area within premises. About 150 TPD waste rock is generated during mining activity which is used in underground for void filling. Presently no waste rock is transported to surface. About 50,000 ton of waste rock, covering 25 % of the total earmarked area (1.6 ha), has been transported to dumping site. Progressive reclamation of waste dump shall be done.

- (v) *Catch drains and siltation ponds of appropriate size should be constructed to arrest silt and sediment flows from soil, OB and mineral dumps. The water so collected should be utilized for watering the mines area, roads, green belt development etc. The drains should be regularly desilted and maintained properly.*

Garland drains of appropriate size should be constructed, to collect surface run-off from the OB and waste dump site(s) and taken to settling pond before discharge.

Runoff water during monsoon is channeled to a low lying area within premises near waste dump. The collected water is reused for mining operation.

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

As Bagjata project is underground mine, OB benches are not applicable.

- (vii) Green belt should be raised in an area of 47.34 ha by planting the native spades 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 is done. Total 3500 tree plantation has been done around mine office, along the boundary and near the shaft which cover about 3.0 ha area. The total mining lease area of the project is 122.73 ha (303.14 acre). Out of total, only 33.86 ha land has been acquired for setting of industrial facilities. As the green belt development in an area of 47.34 ha is not feasible therefore it is requested for reconsideration of the above requirement due to unavailability of land under possession of UCIL. Five hundred (500) tree plantations will be done during monsoon of 2014.

- (viii) 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, Patna.*

Roof top rainwater harvesting scheme has been implemented as conservation measure to augment ground water resources.

- (ix) Regular monitoring of ground water level & quality should be carried out by establishing a network of existing wells & constructing new piezometer during the mining operation. The monitoring should be carried out four times in a year i.e. January, April-May, August, November & the data used thus collected may be sent regularly to MoEF, Central Ground Water Authority & CGWB, and Patna.*

Regular monitoring of ground water level is carried out around the project. Water levels from existing ground level during November 2013 and January 2014 varies as 1.20 to 6.56 m and 2.37 to 8.82 m respectively. The 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. Monitoring of ground water level and quality are regularly sent to the Regional Director, Central Ground Water Board, Patna (ref: UCIL/ENV/BJT/CGWB/03/14 dated 27.02.2014).

- (x) The project authorities should obtain prior approval of the competent authority for drawl of underground 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.

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

Pre-project community health status within 1km from the mine has been submitted to the ministry vide our letter no. UCIL/ENV/BJT/MoEF/21/09 dated 20.05.2009.

(xii) 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.

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

Consent to operate has obtained from JSPCB vide letter no. PC/JSR/AIR/U-23/05/G-1666 dated 20.07.2012.

(xiv) Vehicular emissions should be kept under control and regularly monitored. Overloading of trucks should be avoided to prevent spillage of ore.

Regular maintenance of vehicles is practiced. Overloading of trucks is avoided to prevent the spillages. Ore is transported by the covered truck.

(xv) The project proponent should take all precautionary measures during mining operation for conservation and protection of endangered fauna such as leopard, sloth bear etc. Spotted in the study area in consultation with the concerned forest officials. Action plan for conservation of endangered fauna should be prepared and submitted to the Ministry and its regional office within 3 months.

No endangered fauna has been spotted in lease area. UCIL has submitted the action plan for conservation of fauna, if any, to the MoEF vide our letter no. UCIL/BGT/ENV/MoEF/5/06 dated 31.05.2006.

(xvi) A final mine closer plan along with details of Corpus Fund should be submitted to the Ministry of Environment & Forest 5 years in advance of final mine closer for approval.

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

(xvii) Monitoring of background radiation levels in water, soil & ambient air should be carried out periodically in the study area (core & 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.

Uranium and radium values in 8 ground water samples during December 2013 are well within drinking water standards (U- 60 µg/l and ²²⁶Ra -300 mBq/l). Soil analysis of 6 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 zones shows the variation from 0.05 to 0.16 µGy/hr.

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

Baseline studies of Bagjata Mining site was conducted by Dept. of Environmental Science & Engineering, ISM Dhanbad in association with Health Physics Unit of BARC during 2007. Radiological analysis was carried out for terrestrial vegetation, locally growing vegetables & fruits. Analysis of 18 terrestrial vegetations shows that concentration of U (Nat) varied from 1.2 to 148.5 µg/kg. ²²⁶Ra, Th(α) and ²¹⁰Po values were ranging from 0.18 to 3.16 Bq/kg, 0.1 to 2.09 Bq/kg and 0.36 to 34.2 Bq/kg respectively.

(xix) Discharge from the treatment plant & settling pits should be constantly monitored for concentration of radio nuclides.

Mine discharge water is pumped to desilting tank for removal of silt and then treated in Mine Water Treatment Plant (MWTP). Treated water is reused for industrial purpose within premises. No water is discharged to environment from the mine.

(xx) Sludge from treatment plant & settling pit should be transported in safe containment.

At present sludge is not available. Sludge from MWTP will be transported to Jaduguda Tailing pond.

(xxi) Land ousters & land looser should be compensated as per the State Government norms.

The competent authority has declared 71 awards against the land acquisition of 52.01 acres for Bagjata project. A compensation amount of Rs. 94,83,084/- has been paid. Total 118 employments have been provided.

(xxii) Wet drilling & water spraying on muck should be practiced to reduce generation of silica & 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 mining activities. Radioactivity is measured by HPU of BARC periodically. The external gamma dose rate from 15 locations of the work place during October 2013 to March 2014 varies from 0.20 to 2.96 micro Gy/hr (permissible limit: 8 micro Gy/hr).

(xxiii) 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 being provided to workers engaged in blasting & drilling operations. Noise level is monitored periodically and results are within permissible limit.

B. General Conditions

(i) No change in mining technology & scope of working should be made without prior approval of the Ministry of Environment & Forest.

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 & 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 the buffer zone for (RPM, SPM, SO₂, NO_x, & CO) monitoring .Location of the stations should be decided based on the metrological data, topographical features & environmentally & ecologically sensitive targets in the consultation with the State Pollution Control Board. Data on Ambient air quality (RPM, SPM, SO₂, NO_x & CO) should be regularly submitted to the Ministry including it's regional office at Bhubaneswar & to the State Pollution Control Board/Central Pollution Control Board once in six month.

Ambient air quality at three locations in core and buffer zones during October 2013 to March 2014 in terms of PM₁₀, PM_{2.5}, SO₂, NO_x, Pb and Ni are found within the permissible standards.

(iv) Drills should be either be wet operated or with dust extractors.

Wet drilling is practiced for mining operation. Dust extractors are not envisaged.

(v) Fugitive dust emission from all the sources should be controlled regularly monitored & data recorded properly. Water spraying arrangement on haul roads, wagon loading, dumps; loading & unloading points should be provided & properly maintained.

Fugitive dust emission is controlled by wet operation. Water tankers with water sprinkling arrangement are used for water spraying on road and dusty area. Respirable dust is

monitored in work zone which varies from 0.19 to 0.25 mg/m³ (Permissible limit: 0.80 mg/m³).

- (vi) *Adequate measures should be taken for control of noise level within prescribed standards. Workers engaged in blasting & 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.

- (vii) *Industrial wastewater (workshop & 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 & 31st December 1993 or as amended from time to time. Oil & 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 treated in mine water treatment plant (MWTP) and treated water is reused in industrial operations within premises. Vehicle wash water is treated in oil trap. Oil & grease value in outlet of oil trap was found to be within permissible limits (10 mg/l).

- (viii) *Acid mine water, if any has to be treated & disposed of after confirming to the standard prescribed by the competent authority.*

Not applicable.

- (ix) *Personal working in dusty areas should wear protective respiratory devices & they should also be provided with adequate training & information on safety & 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.

Personnel working in dusty area are provided with PPE. Use of PPE is also monitored. Vocational Training Officer conducts various programs e.g. initial, refresher, special & development trainings on occupational health & safety and other topics as per the certified schedule of DGMS.

Occupational health surveillance:

- Medical teams visit surrounding villages periodically and medicines are supplied free of cost
- Pre employment and Periodical medical examination of all employees for blood test, lung function test, x-ray, audiometric test, ECG & physical tests etc.

- Medical facility is provided for all employees and their dependent at Jaduguda Hospital and reputed referrals hospitals.

During 2013, total 157 employees were medically examined and 578 were given vocational training from mine and plant.

- (x) *Environmental laboratory should be established with adequate number & type of pollution monitoring and analysis equipment in consultation with the state pollution control board.*

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 of Jaduguda monitors environmental and radiological parameters in and around the project.

- (xi) *A separate environmental management cell with suitable qualified personal 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 Bagjata 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.

- (xii) *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, Bhubneshwar of the MoEF and to the Ministry.*

Fund for environmental protection measure is made available. Expenditure for Operation and Maintenance of Mine Water Treatment Plant is about 10 lakh / annum.

- (xiii) *The Regional office of this Ministry located at Bhubneshwar shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer(s) of the Regional office by furnishing 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 have extended our full cooperation to officials of Regional Office of MoEF, Bhubneshwar during their visit.

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

Complied with.

- (xv) *The project authorities should inform to the Regional Office located at Bhubneshwar 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 in May 2005.

- (xvi) *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 by Jharkhand State Pollution Control Board, Ranchi.

- (xvii) *The project authorities should advertise at least in two local newspaper 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 clearance letter is available with the State Pollution Control Board and may also be seen at web site of the Ministry of Environmental and Forests at <http://envfor.nic.in>*

UCIL had advertised for environmental clearance accorded by MoEF in two local newspapers dated 03.04.2005.