

Compliance Status of Environmental condition with respect to Tummalapalle Project of Uranium Corporation of India Limited as on September 2020

| Sl. No. | Specific Conditions | Status of Compliance |
|---------|---|--|
| i | <i>Regular monitoring of subsidence movement on the surface over working area and impact on water bodies/vegetation/structures/surrounding shall be continued till movement ceases completely. In case of observation of any high rate of subsidence movement, appropriate measures shall be taken to avoid loss of life and material cracks shall be effectively plugged with ballast and clayey soil/suitable material.</i> | Subsidence is not envisaged due to mining operation as room & pillar method has been adopted. Reputed institutes such as National Institute of Rock Mechanics (NIRM) & IIT Kharagpur have been associated for rock mechanics study. |
| ii | <i>The Project authorities should check the possibility of existence of fault(s) before deciding about the thickness of safe barriers required to be maintained between the working face and the river in consultation with the director General Mine & safety (DGMS). De-pillaring should be carried out after talking prior approval of the DGMS.</i> | No river and water body exists in core as well as buffer zone. Necessary permission from Director General Mines & Safety (DGMS) is being obtained for all major activity. |
| iii | <i>Garland drain shall be constructed around the mine to prevent ingress of surface off.</i> | Garland drain about 2500 m length have been constructed around the mine to prevent ingress of surface run- off. |
| iv | <i>The crushing and grinding of ore shall be in a closed system. The uranium processing plant shall be provided with adequate number of high efficiency dust extraction and filtration systems. Loading and unloading areas including all the transfer points should have efficient dust control arrangements. These should be property maintained and operated. Fog type suppression system shall be providing in ore stack yard in ore processing plants.</i> | The crushing and grinding of ore is done in a closed system. Fog type dust suppression is provided at ore receiving station & conveyer transfer points in primary crushing unit. High efficiency dust extraction and filtration systems have been provided at various locations of the plant. |
| v | <i>Emissions from the boiler shall be scrubbed before discharging through the stack.</i> | UCIL has adopted in built control mechanism at source to reduce the SO ₂ emission by using LDO as fuel in boiler. LDO contains about 1% of Sulphur, consequently SO ₂ level in flue gas will be less and same is discharged through 54 m high stack, scrubber may not be required. |
| vi | <i>Vehicular emissions shall be kept under control and regularly monitored. Overloading of trucks is avoided to stop spillage. Trucks carrying the mineral shall be covered with tarpaulin sheets to prevent spillage of ore.</i> | Ore from mine is being transported through closed conveyor. Ore generated during initial stage of development is stacked on surface and transferred by dumpers to ore processing plant. |

| | | |
|------|---|---|
| vii | <i>The project authority should implement suitable water conservation measures including rainwater harvesting to augment ground water resources in the area in consultation with the Regional Director, Central Ground Water Board.</i> | Mine discharge water and treated effluents is being used in industrial operation. Re-use of effluents reduces the fresh water requirement. Rainwater harvesting pond which is available inside the mine lease area. |
| viii | <i>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.</i> | Regular monitoring of ground water is being carried out by establishing a network of existing wells. |
| ix | <i>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 MoEF, Central Ground Water authority and CGWB.</i> | The monitoring of ground water level of the existing well around the project is done. The monitoring report is attached as Annexure-I. Report is submitted to CGWB periodically. |
| x | <i>The proponent shall carry out groundwater modelling studied in the area simulating transient conditions to predict the impact of mining on groundwater regime in and around the area on a long-term.</i> | UCIL has conducted Ground water study under BRNS project. Fresh study has been assigned to NABET accredited consultant which is under process & will be finalised after end of Covid-19 pandemic lock down. |
| xi | <i>The mine discharge and effluent discharge shall be recycled in the mine. Discharges from the treatment plant and disposal of sludge shall be undertaken in safe manner and constantly monitored for maintaining the levels of radionuclides in the ambient environment within permissible levels</i> | The mine discharge is treated in ETP and subsequently reused in mine and ore processing plant. Sludge from ETP shall be taken to safe containment in tailing pond. Radionuclides in the ambient environment are monitored by Health Physics Unit of BARC. Monitoring Report is has been furnished in Annexure-III |
| xii | <i>The project authorities shall undertake sample survey to generate data on pre-project community health status within a radius of 1 km from proposed mine. The data so collected shall be made available to the general public, if required.</i> | The sample survey to generate data on pre-project community health status around the mine was conducted. |
| xiii | <i>The monitoring of background radiation levels within 10 km radius and even beyond in water, soil, and ambient air should be carried out periodically in the study area(core and buffer zone) of the project and proper records and maintained therefore the data so collected shall be made available to the general public, if required</i> | Background radiation levels is monitored by health physics unit of BARC. The results of natural gamma dose rate, soil and water qualities are attached as Annexure-II. |
| xiv | <i>The company shall establish full fledged health physics unit/environmental surveillance laboratory at the project site and undertake compressive environmental surveillance for radiological parameters in an around the projects upto 10 km an beyond</i> | A full fledged Health Physics Unit (HPU) is functional at Tummalapalle. HPU monitor the radiological environment on periodical basis. |

| xv | <i>The tailings pond shall be lined to prevent ground water contamination and overflow shall be collected, treated and recycled in the ore processing plant and mine for industrial use, the ETP sludge shall be pumped back to the tailings pond. Effluent shall be treated in the sewage treatment and after conforming to the prescribed standards shall be used for irrigation.</i> | Decanted water from Tailing Pond is being treated in ETP and subsequently reused in processing plant. Sludge from ETP is pumped to tailing pond for safe containment. At present guest house cum residential complex (54 nos dwellings) has been constructed outside the lease area from where sewage is treated in septic tank followed by soak pit. Engineering treatment of the tailing pond surface has been done to prevent seepage, if any. Monitoring wells have been constructed around the tailing pond for periodical surveillance of ground water quality. Monitoring report is has been furnished in Annexure-II. | | | | | | | | | | | | | | | | | | | | | | | | |
|---------|---|---|---------|----------------------------|--------------|---|--------------------|-----|---|--|------|---|--|------|---|--------------------------|----|---|---|-------|---|-------------|--------|--|--------------|----------------|
| xvi | <i>The plant growing in the area, soil invertebrates and local agricultural produce shall be analysed to check the build up of radioactivity levels, if any the data so collected shall be made, available so to the general public, if required</i> | The plant growing in the area and local agricultural produce has been analyzed to check the build up of radioactivity levels. | | | | | | | | | | | | | | | | | | | | | | | | |
| xvii | <i>Plantation shall be developed in an area of 360 ha by planting the native species around the ML area, roads etc. in consultation with the local DFO/agriculture department .The density of the trees shall be around 250 plants per ha.</i> | Plantation and greenbelt development has been in about 85 ha area. UCIL is getting this work done through AP Forest Dept for rest of the area. | | | | | | | | | | | | | | | | | | | | | | | | |
| xviii | <i>Digital processing of the entire lease area using remote sensing technique should be done regularly once in three years of monitoring land use pattern and report submitted to MoEF and its regional office.</i> | Land use patter of the ML area is as under. <table border="1" data-bbox="774 1122 1476 1536"> <thead> <tr> <th>Sl. No.</th> <th>Purpose / Type of land use</th> <th>Present (ha)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Mining and Storage</td> <td>7.6</td> </tr> <tr> <td>2</td> <td>Infrastructure (workshop, Adm. Buildings etc.)</td> <td>3.30</td> </tr> <tr> <td>3</td> <td>Roads (built within mine and ore processing plant)</td> <td>5.20</td> </tr> <tr> <td>4</td> <td>Green belt & plantations</td> <td>85</td> </tr> <tr> <td>5</td> <td>Ore Processing Plant (including ETP and desilting pond)</td> <td>34.50</td> </tr> <tr> <td>6</td> <td>Vacant area</td> <td>677.81</td> </tr> <tr> <td></td> <td>Total</td> <td>813.412</td> </tr> </tbody> </table> <p>Lasted digital processing of the lease area in under process.</p> | Sl. No. | Purpose / Type of land use | Present (ha) | 1 | Mining and Storage | 7.6 | 2 | Infrastructure (workshop, Adm. Buildings etc.) | 3.30 | 3 | Roads (built within mine and ore processing plant) | 5.20 | 4 | Green belt & plantations | 85 | 5 | Ore Processing Plant (including ETP and desilting pond) | 34.50 | 6 | Vacant area | 677.81 | | Total | 813.412 |
| Sl. No. | Purpose / Type of land use | Present (ha) | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Mining and Storage | 7.6 | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Infrastructure (workshop, Adm. Buildings etc.) | 3.30 | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Roads (built within mine and ore processing plant) | 5.20 | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Green belt & plantations | 85 | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Ore Processing Plant (including ETP and desilting pond) | 34.50 | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Vacant area | 677.81 | | | | | | | | | | | | | | | | | | | | | | | | |
| | Total | 813.412 | | | | | | | | | | | | | | | | | | | | | | | | |
| xix | <i>A final mine closure plan along with details of corplus fund shall be submitted to the Ministry of Environment & Forest 5 years in advance of final mine closure for approval.</i> | A final mine closure plan shall be submitted to the ministry 5 years in advance of final mine closure for approval. | | | | | | | | | | | | | | | | | | | | | | | | |
| xx | <i>Land oustees should be compensated as per the state government norms/govt of India policy. Approval R&R policy is implanted</i> | Land oustees have been compensated as per the state government norms/ government of India policy. | | | | | | | | | | | | | | | | | | | | | | | | |

| Sl. No. | General Conditions | Status of Compliance |
|---------|--|---|
| i | <i>No change in mining technology & scope of working should be made without prior approval of the Ministry of Environment & forests.</i> | Noted. |
| ii | <i>No change in the calendar plan including excavation, quantum of mineral uranium & waste should be made.</i> | Noted. |
| iii | <i>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 its regional office at Bangalore & to the State Pollution Control Board/Central Pollution Control Board once in six month.</i> | Ambient air quality monitoring results (core zone and buffer zone) during April 2020 to September 2020 is attached as Annexure-IV |
| iv | <i>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.</i> | Dust emissions are controlled by water sprinklers on haul roads. Fog systems have been provided at ore unloading station, transfer points of conveyer belts. |
| v | <i>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.</i> | Selection of low noise generation equipments have been ensured to control of noise. In addition to above Personal protective equipment (ear muffs/plug) is provided to workers engaged in blasting & drilling operation. Monitoring data of noise levels from April 2020 to September 2020 is attached as Annexure-V |
| vi | <i>Industrial wastewater (workshop & waste from the mine) should be properly collected treated so as to conform to the standards prescribed under GRS 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 effluent from workshop.</i> | Industrial wastewater is not discharge to the environment. Mine discharge is fully reused for industrial purpose. Wastewater from workshop is discharged through oil and grease trap. Annexure-III. |
| vii | <i>Personal working in dusty areas should wear protective respiratory devices & they should also be provided with adequate training & information on safety & Health aspects.</i> | Protective respiratory devices are provided to all persons working in dusty areas and adequate training has been given. |
| viii | <i>Occupational Health Surveillance programme of the workers should be undertaken periodically to observe any contractors due to exposure to radioactive mineral dust & take corrective measures, if needed. The same programme may be extended to adjoining village also.</i> | Occupational Health Surveillance and Periodical medical examination of all employees is done. |

| | | |
|-----|--|--|
| xi | <i>Environmental laboratory should be established with adequate number & type of pollution Monitoring & analysis in the consultation with the State Pollution Control Board.</i> | Environmental laboratory has been established at the site. |
| x | <i>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 organisation</i> | A separate Environmental Management Cell is set up under the control of Env.Engg and it is directly reporting to Unit Head. |
| xi | <i>The funds earmarked for environmental protection measures should be kept in separate account & should not be diverted for other purpose .Year-wise expenditure should be reported to the Regional Office, Bangalore of the MoEF & to the Ministry.</i> | Fund incurred for O & M of ETP, Waste disposal facility (Tailing Pond), DE system, water sprinkling, mine ventilation, environmental monitoring and surveillance. Fund is made available. |
| xii | <i>The Regional Office of this Ministry located at Bangalore 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.</i> | Uranium Corporation of India limited is committed to take action on any requirements/suggestion of the ministry for safe guard of environment .we will extend our full cooperation to officials of Regional Office of MoEF, Chennai. |

Monitoring of ground water on existing well

Water level during April 2020 to September 2020

| Sl. No | Period of monitoring | Location | Water level form Existing ground (mtr) |
|--------|---|----------------------------|--|
| 1 | Pre-monsoon(April 2020) Within 3 kms | Open well, Rachakuntapalle | 10 |
| | | Dugwell, Rachakuntapalle | 22 |
| 2 | Winter (August 2020) Within 3 kms | Open well, Rachakuntapalle | 9 |
| | | Dugwell, Rachakuntapalle | 20 |

Ground water quality during April 2020 to September 2020

| Sl. No | Location | pH | TDS (mg/l) | TSS (mg/l) | Chloride (mg/l) | Sulphate (mg/l) | Total hardness (mg/l) |
|--------|----------------------|---------|------------|------------|-----------------|-----------------|-----------------------|
| 1 | R.K. Palle open well | 7.5-7.9 | 210-240 | Traces | 158-170 | 100-110 | 141-150 |
| 2 | R.K. Palle Dug well | 7.6-7.9 | 196-220 | Traces | 154-165 | 106-120 | 120-140 |

Natural gamma dose rates in and around the project

| Sl.No | Date | Location | Radiation level ($\mu\text{Gy/hr}$) |
|-------|----------|---------------------------------|---------------------------------------|
| 1 | 29.10.20 | Tummalapalle village | 0.04-0.06 |
| 2 | 29.10.20 | M.C.Palle near the school | 0.04-0.05 |
| 3 | 29.10.20 | TMPL near RO plant | 0.04-0.05 |
| 4 | 29.10.20 | Giddangivaripalle near school | 0.04-0.05 |
| 5 | 29.10.20 | Giddangivaripalle near RO plant | 0.04-0.05 |
| 6 | 29.10.20 | Mediapentalla Kota village | 0.04-0.06 |
| 7 | 29.10.20 | R.K.palle near the open well | 0.04-0.05 |
| 8 | 29.10.20 | R.K.palle near school | 0.04-0.06 |
| 9 | 29.10.20 | Kota near bus Stop | 0.04-0.06 |
| 10 | 29.10.20 | KK Kottala near RO plant | 0.04-0.06 |
| 11 | 29.10.20 | Kanampalle near church | 0.04-0.05 |
| 12 | 12.02.20 | Mill gate | 0.04-0.05 |
| 13 | 12.02.20 | Mine gate | 0.04-0.06 |
| 14 | 12.02.20 | Near time office | 0.04-0.07 |
| 15 | 12.02.20 | Near mine office | 0.04-0.06 |
| 16 | 12.02.20 | Near canteen | 0.04-0.06 |
| 17 | 12.02.20 | Personal office | 0.04-0.05 |
| 18 | 09.03.20 | East side of tailing pond | 0.04-0.06 |
| 19 | 09.03.20 | West side of tailing pond | 0.04-0.06 |
| 20 | 09.03.20 | south side of tailing pond | 0.04-0.06 |
| 21 | 09.03.20 | North side of tailing pond | 0.04-0.06 |

Water quality around the project during April 2020 to September 2020 (ranges)

| Sl.No | Location | pH | Hardness mg/l | Cl ⁻ mg/l | U(Nat) $\mu\text{g/l}$ | ²²⁶ Ra mBq/l |
|-----------------------------|---|----------------|---------------|----------------------|------------------------|-------------------------|
| 1 | R.K. Palle Open well | 6.90 | 113 | 11 | 1.8 | 12.6 |
| 2 | R.K. Palle tap water | 7.13 | 294 | 41 | 16.6 | 41 |
| 3 | B.G.Palle bore well (near Shiva temple) | 7.21 | 200-240 | 41 | 6.3 | 8.8 |
| 4 | B.G.Palle Masjid | 7.25 | 250-290 | 63 | 4.5 | 9.4 |
| 5 | Giddangivaripalle hand pump (near school) | 7.31 | 500-700 | 54 | 5.0 | 13.0 |
| 6 | KK Kottala RO plant input water | 7.41 | 201 | 45 | 1.3 | 8.8 |
| 7 | Kanampalle(colony) | 7.86 | 260-280 | 27 | 14.5 | 8.3 |
| 8 | M.C.Palle -1 | 7.48 | 250 | 27 | 14.5 | 7.5 |
| 9 | M.C.Palle -2 | 7.30 | 220 | 40 | 12.4 | 8.5 |
| 10 | Tummalapalle | 7.12 | 300 | 36 | 10.4 | 22.2 |
| Drinking water limit | | 6.5-8.5 | 300 | 250 | 60 | 300 |

Soil Analysis result

| Sl.No | Location | Radium |
|-------|----------------------------|---------------|
| 1 | In and Around Tummalapalle | 46.56 - 99.64 |

Annexure-III

Ground water quality of monitoring wells around the tailing pond during the period of April 2020 to September 2020 (Ranges)

| Sl.No | Location | pH | TDS mg/l | Hardness mg/l | Cl ⁻ mg/l | U(Nat) µg/l | ²²⁶ Ra mBq/l | Sulphate mg/l |
|-------|-------------------------|------|----------|---------------|----------------------|-------------|-------------------------|---------------|
| 1. | Monitoring Bore well -1 | 7.12 | 579 | 333 | 18 | 4.48 | 79 | 20.37 |
| 2. | Monitoring Bore well -2 | 7.24 | 510 | 402 | 27 | 4.25 | 83 | 2.0 |
| 3. | Monitoring Bore well -3 | 7.48 | 661 | 264 | 36 | 1.72 | 29 | 2.25 |
| 4. | Monitoring Bore well -4 | 7.34 | 499 | 392 | 27 | 2.07 | 16 | 2.87 |
| 5. | Monitoring Bore well -5 | 7.45 | 481 | 402 | 18 | 5.63 | 106 | 3.25 |
| 6. | Monitoring Bore well -6 | 7.52 | 526 | 382 | 18 | 1.49 | 102 | 11.25 |
| 7. | Monitoring Bore well -8 | 7.44 | 509 | 402 | 9 | 2.53 | 67 | 9.75 |
| 8. | Monitoring Bore well -9 | 7.27 | 510 | 372 | 9 | 2.41 | 120 | 8.50 |

| Sl. No | Location | pH | TDS | TSS | Chloride | Total hardness | Sulphate | Iron | Oil & Grease |
|--------|-------------------------------------|----------------|-------------|------------|------------|----------------|------------|----------|--------------|
| | | | mg/l | mg/l | mg/l | mg/l | mg/l | mg/l | mg/l |
| 1 | ETP inlet | 10-10.4 | 1000-1250 | 91-99 | - | - | 500-520 | - | - |
| 2 | ETP outlet | 9.4-9.8 | 690-705 | 83-84 | - | - | 380-405 | - | - |
| | Drinking water limit | 6.5-8.5 | 600 | 100 | 250 | 300 | 200 | 1 | - |
| | Inland discharge limit (PCB) | 5.5-9.0 | 2100 | - | 600 | - | 400 | 3 | 10 |

Effluent analysis report during April 2020 to September 2020 (Ranges)

Ambient Air Quality during the period of April 2020 to September 2020

Core zone:

| Sl.No | Location | Operational condition | PM ($\mu\text{g}/\text{m}^3$) (Ranges) | SO _x $\mu\text{g}/\text{m}^3$ (Ranges) | NO _x $\mu\text{g}/\text{m}^3$ (Ranges) |
|-------|-----------------|-----------------------|--|---|---|
| 1. | Mine building | Vehicular movement | 90-99 | 65-67 | 55-56 |
| 2. | Personal office | General | 95-95 | 50-55 | 46-50 |
| 4. | CRD building | Vehicular movement | 85-91 | 60-65 | 55-58 |

Buffer zone:

| Sl.No | Location | Operational condition | PM ($\mu\text{g}/\text{m}^3$) (Ranges) | SO _x ($\mu\text{g}/\text{m}^3$) (Ranges) | NO _x ($\mu\text{g}/\text{m}^3$) (Ranges) |
|-------|---------------------------------------|-----------------------|--|---|---|
| 1 | Tummalapalle Near Gangaraju Home. | General | 50-60 | 20-30 | 22-25 |
| 2 | R.K.Palle near primary school. | General | 46-60 | 25-30 | 16-20 |
| 3 | M.C.Palle near Anandsagar Reddy Home. | General | 40-50 | 26-35 | 20-25 |

Noise level during the period of April 2020 to September 2020

| Sl.No | Location | Noise level dB(A) (Ranges) |
|--------------|-----------------------------|---------------------------------------|
| 1. | Near Mine gates | 64-69 |
| 2. | Near time office | 66-70 |
| 3. | Near west Decline (surface) | 76-77 |
| 4. | Inside the SMS office | 59-64 |
| 5. | Sandwich Mech garage area | 75-79 |
| 6. | Near ROM Down side | 60-62 |
| 7. | Near Mines office | 60-62 |
| 8. | Near Desilting pond | 55-56 |