1.0 INTRODUCTION

The present Pre Feasibility Report (PFR) has been prepared as part of the application for obtaining Terms of Reference (ToR) for carrying out Environmental Impact Assessment and Environmental Management (EIA/EMP) studies for the proposed Uranium Recovery Plant from Copper Tailings at Mosaboni of Uranium Corporation of India Ltd. (UCIL). The plant will use copper tailings of Hindustan Copper Limited (HCL) for recovery of uranium bearing minerals at Mosaboni with a rated throughput (dry) of 9,00,000 t/yr. The Plant is spread over an area 4.158 ha. The project area is located at Rangamatiya and Badia villages, Mosaboni block, East-Singhbhum district of Jharkhand.

Uranium Recovery plant project area measures 4.158 ha. The plant and associated processing have been planned over 3.99 ha area and tailing pipeline has been planned over 0.07 ha along with a water pipeline of 0.098 ha in Mosaboni. A well-developed UCIL’s township already exists at Jaduguda and it can accommodate additional employees of this project in the colony.

Earlier the tailing of the HCL’s Mosaboni Concentrator plant was processed by UCIL at Mosaboni Uranium Recovery Plant to obtain a concentrate with certain amount of uranium bearing minerals. However, HCL’s plant operation was suspended owing to closure of the copper mines. Recently, HCL has restarted its mines and concentrator plant. In view of this, UCIL also planning to restart its uranium recovering plant.

As stated above, Hindustan Copper Limited (HCL) was operating Concentrator Plant at Mosaboni which was fed by Surda and other copper mines of HCL. The copper tailing was containing \( \text{U}_3\text{O}_8 \) in the range of 0.006 to 0.008 %. Uranium Corporation of India Limited (UCIL) had set up a pilot plant at Mosaboni in April 1980 to recover mineral concentrate from copper tailing on experimental basis. A full fledge Uranium Recovery Plant at Mosaboni of UCIL was commissioned in January 1987. Total 96 number wet concentrating tables were installed to treat 2000 tonnes per day of copper tailing. Due to variable copper demand, HCL closed down their mines and concentrator plant at Mosaboni in year 2002. Consequently Uranium Recovery Plant was also stopped due to non availability of copper tailing from Mosaboni concentrator plant. Further there was no possibility of restarting the mines and concentrator plant of HCL at Mosaboni in near future, UCIL closed down the Mosaboni Uranium Recovery Plant in April 2004. Accordingly Jharkhand State Pollution Control Board was informed vide UCIL letter dated 18th April 2003 (copy enclosed as Fig.1) for stoppage of discharge of effluent.

Recently HCL had restarted its mines and Concentrator Plant. HCL is also planning for expansion of its mines and subsequently it’s Concentrator Plant. Accordingly UCIL has decided to reinstall the recovery plant at Mosaboni to process 4,05,000 t/yr of copper tailing in the first phase and with ultimate capacity of 9,00,000 t/yr in the final phase.
The concentrate recovered from the proposed Recovery Plant will be further processed at UCL’s Jaduguda Ore processing plant. Ministry of Environment, Forest and Climate Change (MoEFCC), Govt. of India has granted Environmental Clearance (EC) for Jaduguda Mine and Ore Processing Plant vide letter no. MoEFCC’s letter No. J-11015/710/2007-IA.II (M) dated 6th May, 2011 for 2500 TPD ore processing capacity. CTE and CTO have already been granted by Jharkhand State Pollution Control Board (JSPCB).

As per Environmental (Protection) Act, 1986, all new projects or expansion of any existing project necessitates prior environmental clearance from appropriate statutory authorities. Also, in accordance with the objectives of National Environmental Policy as approved by the Union Cabinet on 18th May, 2006 and EIA Notification dated 14th September, 2006 and related guidelines, carrying out EIA/EMP study and preparation of the EIA/EMP report is part of the process for obtaining Environmental Clearance from Ministry of Environment, Forest and Climate Change (MoEFCC). As part of the process of obtaining EC, UCIL is submitting an online formal application to MoEFCC in the prescribed format (Form I) along with a Pre Feasibility Report.

This report contains information on the proposed project which includes the following:

- Introduction of the Project / Background Information
  - Identification of the Project and the Project Proponent
  - Brief Information of the Project
  - Need for the Project and its Importance to the Country or Region
  - Demand and Supply
  - Import vs. Indigenous Production
  - Export Possibilities
  - Domestic / Export Market
  - Employment Generation

- Project Description
  - Type of Project including Interlinked and Interdependent Project
  - Location
  - Details of Alternate Site
  - Size and Magnitude of Operation
  - Plant Description
  - Mineral Transport
  - Life of the Project
  - Raw Materials
  - Resource Optimization / Recycling and Resource
  - Site Services
  - Wastes
• Site Analysis
  ◦ Connectivity
  ◦ Land Form, Land Use, Ownership
  ◦ Land use
  ◦ Existing infrastructure
  ◦ Soil classification
  ◦ Climate
  ◦ Social infrastructure available

• Planning Brief
  ◦ Planning Concept
  ◦ Land Use Planning
  ◦ Assessment of Infrastructure Demand
  ◦ Amenities / Facilities

• Proposed infrastructure

• Resettlement and Rehabilitation Plan

• Project Schedule and Cost Estimate

• Analysis of Proposal (Final Recommendation)

ACKNOWLEDGEMENT

MECON wishes to place on record its deep appreciation for the trust reposed in MECON by UCIL and for the active interest and help extended by UCIL officials.

2.0 INTRODUCTION OF THE PROJECT / BACKGROUND INFORMATION:

2.1 IDENTIFICATION OF PROJECT AND PROJECT PROPONENT:

Uranium Corporation of India Limited (UCIL), a Government of India undertaking under the administrative control of Department of Atomic Energy (DAE) was established in 1967 to mine and process uranium ore to meet the nuclear fuel requirements of India. UCIL is at the forefront of the Nuclear Power cycle. UCIL is producing strategically important $\text{U}_3\text{O}_8$ (yellow cake) which is categorized as a prescribed substance in the Atomic Energy Act, 1962. UCIL’s uranium mines in the country are as follows:

• Bagjata underground uranium mines at East Singhbhum Dist., Jharkhand
• Banduhurang opencast uranium mines at East Singhbhum Dist., Jharkhand
• Bhatin underground uranium mines at East Singhbhum Dist., Jharkhand
• Jaduguda underground uranium mines at East Singhbhum Dist., Jharkhand
• Narwapahar underground uranium mines at East Singhbhum Dist., Jharkhand
• Turamdih underground uranium mines at East Singhbhum Dist., Jharkhand
• Mohuldih underground uranium mines at Seraikella-Kharsawan Dist., Jharkhand
• Tummallapalle underground uranium mines at YSR Dist., Andhra Pradesh
In order to enhance the production of Uranium, UCIL has planned to enhance the production capacity and exploit techno-commercially viable deposits at various places in the country. UCIL has proposed to set up uranium mines and processing plants at following locations:

- Gogi underground uranium mines at Yadgir District, Karnataka
- Lambapur-Peddagattu underground uranium mines at Nalgonda District, Telangana
- Kyelleng-Pyndengshiong, Mawthabah (KPM) opencast uranium mines at West Khasi Hills District, Meghalaya.

UCIL has ore processing plants to extract uranium as crude salt at the following locations:

- Jaduguda in East Singhbhum District, Jharkhand
- Turamdih in East Singhbhum District, Jharkhand
- Tummallapalle in YSR District, Andhra Pradesh

At present uranium ores mined at UCIL’s Jaduguda, Bagjata, Bhatin and Narwapahar mines are processed at the ore processing plant at Jaduguda. The ore from Banduhurang, Turamdih, and Mohuldih mines are processed at the new ore processing plant at Turamdih. The Tummallapalle plant process the ore from the adjacent mine.

In the present proposal, UCIL has decided to recover uranium bearing minerals from copper tailings of HCL at Mosaboni in its proposed Plant with a throughput (dry) of 9,00,000 t/yr (1st phase: 4,05,000 t/yr; 2nd phase: 9,00,000 t/yr).

The Mosaboni Copper Concentrator Plant (MCCP) of Hindustan Copper Limited (HCL) currently receives feed from Surda mine. At MCCP, ore is crushed, ground and then further processed to deliver a concentrate with increased chalcopyrite content. The enriched chalcopyrite concentrate usually contains about 25% copper. The beneficiation is carried out by froth flotation whereby higher grade copper ore product is obtained as froth. The part of the ore not obtained as froth has poor copper content, averaging around 0.07%, and is usually discarded as ‘tailings’. Tailings are classified using hydrocyclone, the coarser product of which is used for stowing. The finer product of classification is dewatered in a thickener and, at present, stored in ‘tailings ponds’ for recovery of water, and for eventual other usage.

As stated earlier, it has been planned to set up a Uranium Recovery Plant of 9,00,000 t/yr with the established technology of tabling process (based on report of Indian School of Mines, Dhanbad).
Detail Project Report (DPR) for the proposed Uranium Recovery Plant has been prepared by Development Consultants Pvt. Ltd., Kolkata. The estimated project cost is estimated to be ~Rs. 49.93 crore for 4,05,000 t/yr and ~Rs. 95.00 crore for 9,00,000 t/yr.

2.2 BRIEF INFORMATION OF THE PROJECT:

The project falls [Sl.no. 2(b) of Schedule: “List of project or activities requiring prior Environmental Clearance”] of MoEFCC Notification dated 14th September, 2006, and its amendments in Nov.-2009 & April -2011. The project is of Category A based on its area proposed production target (0.9 Mt/yr).

As stated above the Plant will treat the tailings of HCL’s Concentrator Plant. Initially the plant will operate with 4,05,000 t/yr production capacity and later on it will be increased to 9,00,000 t/yr in line with the expansion plan of concentrator plant of HCL.

2.3 NEED FOR THE PROJECT AND ITS IMPORTANCE TO THE COUNTRY OR REGION:

Nuclear power generation in India has been planned to be increased from 5780 MW at present to 20,000 MW by the year 2020. This will lead to increased demand for uranium. Consequently, UCIL plans to increase the production capacity from its existing mines and also develop new mines. Recovery of Uranium bearing minerals from Copper tailings at Mosaboni is part of this programme to facilitate the increased demand of uranium for India’s nuclear power industry.

Uranium Recovery Plant will have the following benefits:

- Increase supply of uranium bearing minerals for India’s nuclear power programme.
- Alternative for reducing coal dependency.
- Reduces power shortages hindering growth, foreign investment and productivity.
- Generate additional employment, both direct and indirect which will lead to economic growth of the industrial sector as well as country.
- Quality of life of local populace in villages shall improve due to company’s community development programmes.
- Recovery of uranium from waste (copper tailing) will improve the quality of environmental discharge.

2.4 DEMAND AND SUPPLY GAP:

India’s atomic energy programme, in spite of opportunities for import of fuel shall continue to prefer the ideal path of generating power using indigenous uranium. But, demand of fuel for nuclear reactor is not fully met by indigenous uranium. India currently has 21 nuclear power reactors in operation, generating around three percent of the country’s total electricity. At present with 5780 MW of installed nuclear power capacity, about 32% of fuel requirement is met by imported uranium. With addition of more nuclear power reactors, demand and supply gap of uranium is likely to increase.
To meet the increasing demands of a rising economy, India is expanding its nuclear energy grid from today’s 5780 MW of energy to generate 20,000 MW by 2020. The grade of uranium ore in India being low, inevitable efforts to mine and process progressive lower grade ore does not record matching rise in uranium production capacity.

Indian uranium deposits are of medium size and the country has a modest uranium resource. Only a small part of the land mass of the total of 3.28 million sq. km of Indian sub-continent is assumed to be geologically favorable for hosting uranium deposits. Of the total uranium resources identified so far, Jharkhand accounts for about 45%, Andhra Pradesh 26%, Meghalaya 16%, Rajasthan and Karnataka 4% each and remaining in other states.

2.5 IMPORT VS INDIGENOUS PRODUCTION:

Briefed in clause 2.4 above.

2.6 EXPORT POSSIBILITIES:

Uranium bearing minerals produced from this project will be processed at Jaduguda Ore Processing Plant where the uranium bearing minerals will be extracted as Mangnesium Diuranate (MDU) yellow cake. The MDU will be dispatched to Nuclear Fuel Complex Hyderabad for further processing.

2.7 DOMESTIC / EXPORT MARKET:

Refer 2.6 above.

2.8 EMPLOYMENT GENERATION:

The proposed project will employ a ~51 people for 1st phase (comprising of 1 Executive, 10 supervisors, 22 skilled workers and 18 unskilled workers) and ~80 in 2nd phase. It is envisaged that some of the services like light vehicle operation, cleaning, canteen facilities etc. shall be carried out through contracts. However, the indirect employment will be two-three folds of the estimated direct employment. Employment is expected in transportation activities, vehicle repair & maintenance, service providers for the enlarged work-force etc. Increased awareness for education and skill development opportunity will facilitate employment generation.

Majority of the unskilled and semiskilled workers will be from local village. The officers, supervisors and rest of the workers will be housed in UCIL’s township at Jaduguda (~22 Km from proposed plant).
3.0 **PROJECT DESCRIPTION**

It has been planned to recover uranium bearing minerals by processing Copper tailings of HCL at UCIL’s proposed recovery plant at Mosaboni. The plant will be operated based on ‘tabling process technology’. Estimated cost of the proposed project will be ~Rs. 49.93 crore for 4,05,000 t/yr and ~Rs. 95.00 crore for 9,00,000 t/yr. The total plant area of the project is 4.158 ha.

3.1 **TYPE OF PROJECT INCLUDING INTERLINKED AND INTER-DEPENDENT PROJECT**

The proposed project is an interlinked project. It will receive tailings from HCL’s Concentrator Plant and the concentrate recovered from tailings will be processed in UCIL’s Jaduguda Ore processing plant. MoEFCC has granted Environmental Clearance for Jaduguda Mine and Ore Processing Plant vide letter no. MoEFCC’s letter No. J-11015/710/2007-IA.II (M) dated 6th May, 2011 for 2500 TPD ore processing capacity. CTE and CTO for Jaduguda have already been granted by JSPCB, Ranchi. HCL has already started the process of obtaining Environmental Clearance for expansion of its Concentrator Plant.

3.2 **LOCATION**

Proposed plant is located at Mosaboni in East Singhbhum district of Jharkhand. The plant is spread over 4.158 ha under village Rangamatiya and Badia in Mosaboni Block. Nearest railway station, Ghatsila on Howrah-Mumbai main line, is located at an aerial distance of ~8.5 km ENE of plant. The nearest national highway, NH-33, is located at an aerial distance of 7.5 Km away from the plant. The nearest functional airport is at Ranchi at ~150 km (aerial distance) from the plant. An abandoned World War-II airstrip (Dhalbhumgarh) is ~9.5 km away.

Plant falls under 22°30’55.22" N latitude & 86°27’23.03" E longitude and falls under Survey of India toposheet No. 57 J/6. Location of the plant area is shown in Drawing No. MEC.11.S2.Q778.TOR.01 (Annexure 2 of application document).

Other industries within 15 km the project site are Indian Copper Complex (ICC) comprising of copper mines, Copper Ore Concentrator and Copper Smelter cum Refinery of HCL and Bagjata mines of UCIL.

3.3 **DETAILS OF ALTERNATE SITE:**

Since the project envisages construction of Recovery Plant at UCIL’s available land nearby HCL’s Concentrator Plant, possibility of alternate site does not arise.
3.4 SIZE AND MAGNITUDE OF OPERATION:

The present proposal envisages recovery of uranium bearing minerals from HCL’s tailings at Mosaboni. The project area is spread over 4.158 ha. The throughput of the plant is 0.9 Mt/yr of copper tailings.

3.5 PLANT DESCRIPTION

3.5.1 Geology:

Regional Geology of the area

The geology of the region is confined to the geological disposition of the Singhbhum Thrust Belt (STB), which is well known for the copper - uranium mineralisation. In the eastern flank of the STB, the uranium mineralisation from Jaduguda to Rajdah up to east of Garanala, is found to associate with quartz, granular rock (meta-graywacke) with intercalation of conglomerate and chlorite schist. In the western part of the belt the mineralisation is mostly confined within chlorite-schist as observed in Narwapahar and Dudra. The mineralisation horizon in the east (Jaduguda, Bhatin) is overlain by quartzite with associated minor amount of sericite schist. This quartzite formation gradually transgresses to sericite schist from the west of Bhatin and continues further westward up to Turamdih of Dudra through Nimdih and Narwapahar.

The quartzite/sericite band overlying the copper-uranium mineralisation over the whole stretch of the STB from Roamrakha-Jaduguda in the east to Mohuldih in the west has been considered as a marker horizon for locating mineralisation.

The quartzite/sericite schist is overlain by mica-schist with occasional lenses of quartzite. A thin band of talcose-sericite schist has been reported to occur below the mineralized chlorite schist in the western and the eastern parts without any exposures in the central region of the belt.

The bottom most rocks of the region are represented by Dhanjori group of formation like conglomerate, quartzites with metabasics. The basement Singhbhum granite is exposed in the south. The eastern and western parts of the region are marked with intrusion of soda - granite which is regarded to be responsible for the copper - uranium mineralisation. Chronological disposition of the rock formation in the region, as depicted by AMD, is as follows:

- Soda granite
- Mica schist
- Quartzite/ Sericite schist
- Meta-graywacke (Quartz granular rock)/chlorite schist
- Talcose-sericite schist
- Banded quartzite with/without magnetite
- Conglomerate, quartzite and metabasics
- Singhbhum granites.
Local geology and structure

Uraninite is the most common radioactive mineral found to occur in the mineralisation. It is mostly associated with chlorite in form of inclusion. The radioactive minerals of less significance include uraniferrous goethite and epidote. The uranium mineralisation is always bottomed by talc-sericite schist and hence can be used as a guideline for demarcation between mineralized and non-mineralized horizon during mining.

The Singhbhum Copper Belt is within a zone of over-thrust and shearing which varies in width from a few hundred metres to 2.5 km in width at the Mosaboni Mine, and around 1 km wide at Surda. The thrust generally dips gently to the north at angles of between 30° and 50°, and is very persistent with depth, having been traced down dip as far as 2.7 km. The shear plane acts as the loci of ultramafic and mafic igneous activity and of soda-metasomatism and apatite-magnetite uranium-copper mineralisation within the district. In general the thrust zone thickens from east to west. In the south-east it involves rocks of the Iron Ore Series, which belong to the Singhbhum Craton to the south, the Dhanjorivolcanics of the Singhbhum Group to the north and sodagranites which are largely a migmatitic/ metasomatic alteration product. In the middle, and further west, it involves chlorite schists which are believed to be after Dhanjori basic volcanics, metasediments of the Iron Ore Series, Osodagranites, and granophyres and granite gneisses which were intruded along the thrust zone.

3.5.2 Mineral Processing:

System Description

Conventional process of extraction of uranium bearing minerals from copper tailings by tabling process has been envisaged.

Coarse Ore Storage & Crushing, Milling

Tailings coming from Concentrator Plant of Hindustan Copper Limited will be the throughput material for the Recovery Plant. No Crushing, Milling circuit has been envisaged.

Screening & Table

One trash screen (Mesh 28) has been envisaged to separate out the higher size particles. A tank with agitator has been considered followed by Distributor & Re-distributor / sub-distributor. From re-distributor / sub-distributor slurry will be sent to Shaking table for gravity separation. Double deck tables are preferred over single deck for better performance.
Decanter, Concentrate Pit

Concentrate from the tables are collected in a sump and then fed to Decanter. Decanted water is collected in a sump, decanted solid enriched with Uranium will be sent for transportation.

Thickening

Tailings from the Tables are collected in a launder followed by a sump. A vertical sump pump will feed the tailings to the thickener. An existing thickener of 35m diameter will cater the requirement of the thickener. Rake arrangements shall be refurbished.

Clarification

Thickener overflow will be collected in an existing Raw Water Clarifier. Rake arrangements of the clarifier shall be refurbished. Underflow of the clarifier shall be collected in a common sump where thickener under flow will also be collected. Final tailings will be sent to Sand Classification which is under the scope of Hindustan Copper Limited (HCL).

Under the proposed proposal it is envisaged that the plant will be operating 300 days in a year with 3 shifts of working. Description of the system has been shown through process flow sheet in **Fig. 02**.
3.6 MINERAL TRANSPORT

The tailings from HCL will be received through pipeline. After recovery of uranium bearing minerals from tailings, reject will be pumped back to Mosabani Concentrator Plant of HCL through pipeline. The concentrate from the plant will be transported to Jaduguda Ore processing plant by 20t capacity trucks.

3.7 LIFE OF THE PROJECT

Since the project is a recovery of uranium bearing minerals from copper tailings and directly a dependent project, therefore life of the proposed project depends on material availability in form of tailings. However, design life of plant is estimated to be 20 years.

3.8 RAW MATERIALS

The raw material requirements for the ore processing plant are given in Table 5:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Raw Material</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lime</td>
<td>450.0</td>
</tr>
<tr>
<td>2</td>
<td>Flocculent</td>
<td>9.0</td>
</tr>
<tr>
<td>3</td>
<td>Ferric Alum</td>
<td>43.2</td>
</tr>
</tbody>
</table>

Figures are in t /yr

3.9 RESOURCE OPTIMISATION / RECYCLING AND RESOURCE

The proposal is recovery of ore (viz. uranium bearing minerals) from tailing waste (viz. tailings).

3.10 SITE SERVICES

3.10.1 Water Requirement:

Water requirement for various purposes in the complex and their sources is shown in Table 6.

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Average Demand</th>
<th>Peak Demand</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process</td>
<td>756</td>
<td>756</td>
<td>Subamrekha river</td>
</tr>
<tr>
<td>Drinking</td>
<td>10</td>
<td>10</td>
<td>Subamrekha river</td>
</tr>
<tr>
<td>Total</td>
<td>766</td>
<td>766</td>
<td></td>
</tr>
</tbody>
</table>

Figures are in m³/day

Water will be withdrawn from existing water pipe line of Mosaboni Concentrator Plant of HCL which draws water from Subamrekha River. Water distribution network and provision has been kept for intake from Subarnrekha River (~2 Km away). The
proposed provision shall include intake pump house, pumps, pipe line, water treatment plant, water tanks for industrial and drinking water and in-plant distribution.

UCIL has submitted an application to SDO for obtaining permission for tapping water from the pipeline of existing water supply system being used by HCL. Water drawal permission from the Water Resource Department/ concerned authority will be applied.

3.10.2 **Power Requirement**

Maximum power demand for the proposed project has been estimated to be 0.75 MW for 0.40 Mt/yr and 1.20 WM for 0.90 Mt/yr. The power supply for the proposed Uranium Recovery Plant will be received at 11kV level by one of the 11kV overhead line passing along the periphery of plant boundary. Power supply for the water intake system shall be received at 11 kV line by 11 kV overhead line of JSEB feeding the HCL pump house.

Moreover, in order to meet the requirement of emergency power, one no. 180kVA, 415V Diesel Generator set has also been envisaged for the proposed plant.

3.10.3 **Amenities**

Presently no infrastructure is present at site. It is proposed to provide rest shelters with drinking water facilities, toilets, bathing and washing facilities and canteen for all the employees at plant. There will be a First Aid Centre with an ambulance. Other amenities and infrastructure, such as township, hospital, stores, workshop, community centre, schools etc. of UCIL’s township at Jaduguda will be made available to all the employees.

3.11 **WASTES**

The copper tailings from HCL will be received through pipeline at UCIL’s proposed recovery plant and the rejects generated after recovery of uranium bearing minerals from tailing, will be pumped back to Mosaboni Concentrator Plant of HCL through pipeline. No waste generation is envisaged in the proposal.

4.0 **SITE ANALYSIS**

4.1 **CONNECTIVITY**

Proposed plant is located at Mosaboni. The plant can be approached from the all weather road connected by Tatanagar-Narwapahar-Jaduguda road. About 5 km north of Mosaboni, a road branches off from the Jamshedpur – Mosaboni Road and leads to Ghatsila. The nearest National Highway is NH-33, which is at an aerial distance of 7.5 km NE the plant and can be approached via Ghatsila.

Nearest Railway Station is at Ghatsila about 8.5 Km North of the site located on SE Railway’s main BG Howrah – Mumbai line. There is an abandoned WWII airstrip at Dhalbhumgarh ~9.5 km E of the plant. The nearest airport is Sonari at Jamshedpur.
which is ~45 km NW of the plant. The nearest functional airport is at Ranchi at ~150 km (aerial distance) from the plant. Proposed plant is located between 22°30′55.22" N latitude & 86°27′23.03" E longitude under Survey of India toposheet No. 57 J/6.

4.2 LAND FORM, LAND USE, OWNERSHIP

The total plant area of 4.158 ha comes under Rangamatiya village (4.061 ha) and Badia village (0.097 ha). No forest land involve in the project. The project area comprises of 3.251 ha government land and 0.907 ha private land. Of the total project area, 0.907 ha of private land is already been acquired by UCIL. There is no proposal to acquire any additional private land.

Earlier HCL had transferred ~1.214 ha (3 acres) of land to UCIL on lease basis. However, later on, HCL surrendered the lease including this ~1.214 ha (3 acres) land to Government. In view of this, an application has been made by UCIL requesting Govt. of Jharkhand to transfer the land to UCIL.

4.3 TOPOGRAPHY

The topography of the area acquired for the project is more or less flat to gently undulating.

4.4 LAND USE

The proposed Uranium Recovery Plant has been planned over 4.158 ha area which comprises of following:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Purpose / type of land use</th>
<th>Area (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Plant Area</td>
<td>3.990</td>
</tr>
<tr>
<td>2</td>
<td>Tailing Pipe line</td>
<td>0.070</td>
</tr>
<tr>
<td>3</td>
<td>Water Pipeline</td>
<td>0.098</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>4.158</strong></td>
</tr>
</tbody>
</table>

4.5 EXISTING INFRASTRUCTURE

The project office, plant building, rest shelters, canteens, workshop, stores, electrical sub-station, First Aid center, Weigh Bridge and other required infrastructure will be newly constructed after receiving necessary clearances for statutory bodies.

Other amenities and infrastructure, such as township, hospital, stores, workshop, community centre, schools etc. are already present in UCIL’s township at Jaduguda, and will be made available to all employees.
4.6 **SOIL CLASSIFICATION**

As per the District Planning Map of East Singhbhum, published by National Atlas and Thematic Mapping Organization, Kolkata the soil of the area where the project is located is classified as “Red Loamy Soil”.

Allowable bearing pressure varies from 150 kN/m² (filled-up soil) to 200 kN / m² (virgin soil) at a depth of 1 to 2 m below original ground level measured earlier.

4.7 **CLIMATE**

The study area lies in tropical region where climate is characterized by very hot summers and cool winters. The nearest observatory of India Meteorological Department (IMD) is at Kadma Colony in Jamshedpur, about 40 km away.

Summer is typically from mid-March to mid-June when temperature ranges from a maximum of 40.1°C during day time to a minimum of 18.6°C at night. Winter is from December to February when the maximum temperature during day goes up to 29.4°C and minimum temperature at night becomes 11.6°C. The average annual rainfall is 1321 mm. The South-west monsoon lasts from mid-June to mid-September and the area gets more than 80% of the annual rainfall during this period. The proposed area falls under Seismic zone II.

4.8 **SOCIAL INFRASTRUCTURE AVAILABLE**

All amenities and infrastructure, such as township, hospital, stores, workshop, community centre, school, bank etc. are already present in UCIL’s township at Jaduguda, where employees will be resident.

5.0 **PLANNING BRIEF**

5.1 **PLANNING CONCEPT**

M/s Uranium Corporation of India Limited (UCIL) proposes to set up a Uranium Recovery Plant from Copper tailings at Mosaboni, Dist. Singhbhum (East), Jharkhand. The MoU will be signed between HCL and UCIL for obtaining tailings from HCL’s Concentrator Plant. A request letter of UCIL is attached as Fig.3:

5.2 **LAND USE PLANNING**

At the time of closure, the plant will be shut down and closure will be done as per the guidelines by Atomic Energy Act, 1962 and guidelines issued by Atomic Energy Regulatory Board. Greenbelt will be developed along boundary of Plant. Plantation will also be carried out inside the Plant.
Upon completion of plant operation, such land must be rehabilitated to a stable condition that will be suited for alternative land uses. These alternate land uses will be compatible with the established land fabric (terrain, climate, soils, land use and infrastructure) and/or consistent with the pre-plant operation and that will be of benefit to the local community.

5.3 ASSESSMENT OF INFRASTRUCTURE DEMAND

As described above, the project office, plant building, rest shelters, canteens, workshop, stores, First Aid center and other required infrastructure will be newly constructed.

During 1st phase, the project will employ 51 persons, many of whom, especially most of the unskilled and semiskilled workers, will be from local villages. The rest comprising of the officers, supervisors, some of the office staff, skilled and semiskilled workers may come from outside. These people will be provided accommodation in the existing township of UCIL at Jaduguda. The man power requirement in 2nd phase is expected to be 80 nos. of persons.

5.4 AMENITIES / FACILITIES

During the process of execution of the construction, all amenities like site office, rest shelters, canteens, workshop, store, First Aid center etc. will be newly constructed.

6.0 PROPOSED INFRASTRUCTURE:

The project sites are connected by road network. Presently no infrastructure present at proposed site. The project office, plant building, rest shelters, canteens, workshop, stores, First Aid center and other required infrastructure is proposed to be newly constructed.

Green Belt & Plantations: Green belt will be developed within the proposed plant area. Small shrubs and vegetations are present at site.

CSR Activities: UCIL takes an active role in CSR activities for peripheral development of the region. UCIL has been awarded “Golden Peacock Award” for Corporate Social Responsibility for the year 2013 for their remarkable work in the area of CSR.

UCIL is carrying out various socio-economic measures under Corporate Social Responsibility for all its projects at villages surrounding the projects site. Similar CSR measures will be undertaken for under this project also. Some of the major CSR activities already taken up are as follows
- Holding of medical camps, supply of medicines to villagers.
- Improving drinking water supply systems and infrastructure in peripheral villages
- Improvement of education facilities in villages
- Setting up of solar powered street lights in villages
- Construction of roads
- Setting up of community toilets
- Financial and material assistance for village festivals, cultural events and sports activities
- Training, skill development and women empowerment
- Improvement in agricultural activities

UCIL’s CSR budget for 2015-16 is Rs.2.65 Crore. Annual expenditure towards CSR activities during the last seven years are as follows:

- 2014 – 15: Rs. 2.21 Cr
- 2013 – 14: Rs. 2.37 Cr
- 2012 – 13: Rs. 2.23 Cr
- 2011 – 12: Rs. 3.22 Cr
- 2010 – 11: Rs. 1.82 Cr
- 2009 – 10: Rs. 1.35 Cr
- 2008 – 09: Rs.4.28 Cr

7.0 REHABILITATION & RESETTLEMENT (R&R) PLAN

The project does not envisage any R&R as private land proposed for the proposal has been already acquired. No new leasing or acquisition of private land required. Hence there will not be any land oustees who have to be resettled or rehabilitated.

8.0 PROJECT SCHEDULE & COST ESTIMATE

8.1 Likely Date of Start of Construction and likely date of completion:

The production will start only after obtaining all applicable statutory clearances. The Recovery Plant will take ~2 to 2½ years to complete.

8.2 Estimated Project Cost Along and Economic Viability of the Project

The estimated capital cost of the proposed project is ~Rs. 49.93 crore for 4,05,000 t/yr and ~Rs. 95.00 crore for 9,00,000 t/yr productions.

9.0 ANALYSIS OF PROPOSAL (FINAL RECOMMENDATION)

The project will have the following benefits:
It is an environmental friendly as it is based on resource recovery from waste.

Increase the availability of uranium to meet the India’s Nuclear fuel requirement and will also reduce dependency on import of nuclear fuel

In addition it will add to revenue generation of the District / State.

A better alternative for reducing coal dependency.

The plant will generate additional employment, both direct and indirect which will lead to economic growth of the industrial sector as well as country.

UCIL shall provide, school buildings, bus shelters, medical facilities and other amenities to local villages under the company’s community development programme.

Keeping in view of the requirement of nuclear fuel for the growth of India’s nuclear power sector requirement, environment friendly waste optimization process and social development of the local region linked with the proposed project, implementation of the project will be beneficial.
Fig. 1: UCIL’s letter to JSPCB for closure of the Uranium Recovery Plant

To,
The Regional Officer
Jharkhand State Pollution Control Board
Regional Office-cum-laboratory
MB-15, New Housing Colony

Sub: Stoppage of discharge of effluent / filing of return towards water cess at MURP

Sir,

Discharge consent order for the release of effluent was granted vide memo no. JA/2048/W/2858 dated 25/9/2002 in respect of Mosabani Uranium Recovery Plant, Mosabani, East Singhbhum.

It is to inform you that we have stopped all processing activity in Mosabani Uranium Recovery Plant completely from 1st January, 2003 due to closure of concentrator plant of M/s Hindustan Copper Limited at Mosabani whose tailings was being treated in our plant for the recovery of uranium mineral concentrate. Hence we shall not be submitting application for the renewal of the aforesaid consent order after the expiry of the existing consent order.

Please further note that as we have stopped the MURP from 1st January, 2003 we have not consumed any water for processing activity, hence we have not filed the returns for water cess from January, 2003 onwards towards Mosabani Uranium Recovery Plant. Please also be informed that we will not be filing returns for water consumption towards MURP in future also as there is no consumption of water for processing activity at Mosabani Uranium Recovery Plant.

You are also requested to send us the pending / corrected bills for water cess towards MURP for an earlier settlement.

Thanking you,

Yours Truly,
For Uranium Corporation of India Limited

(S.K.Srivastava)
Chief Supdt. (MII)

Cc: The Member Secretary,
Jharkhand State Pollution Control Board, - For necessary action please.
T.A. Building, HEC Compound, Dhourwa, Ranchi.

Tel. : "UCIL" Jaduguda Mines

©, 2016 MECON LIMITED, All rights reserved
Fig.3: Copy of request letter to HCL for providing tailings to UCIL for recovery of uranium bearing mineral

Ref: UCIL/DT/21/2015  Date: 30.10.2015

Shri H.C. Shrivastava
Executive Director
Hindustan Copper Limited
P.O. Moulibandar
Dist: East Singhbhum
Jharkhand – 832103

Sub: Consent for continuous supply of copper tailings to Uranium Recovery Plant at Mosaboni.

Dear Sir,

This has reference to our earlier communication vide letter UCIL/DT/21/2015 dt.05.02.2015 in connection with the consent of M/s. Hindustan Copper Limited (HCL) to supply the tailings of Mosaboni Concentrator Plant to the upcoming project of Uranium Corporation of India Limited (UCIL) for the recovery of uranium value associated with it. The project has been approved by the Government of India with the intention to recover the scarce strategic material from the tailings. The project has special importance because of associated benefit of control of harmful radioactive discharge to the environment. As per recent guideline, UCIL can start the ground work of the project only after the receipt of formal consent from HCL.

In view of the above, you are requested to give your response at an earliest.

Thanking you,

Yours faithfully,

(S.K. Shrivastava)
Director (Technical)

Copy to: Shri Malay Mandal
Ch. Supri (Min)
UCIL, Jaduguda.