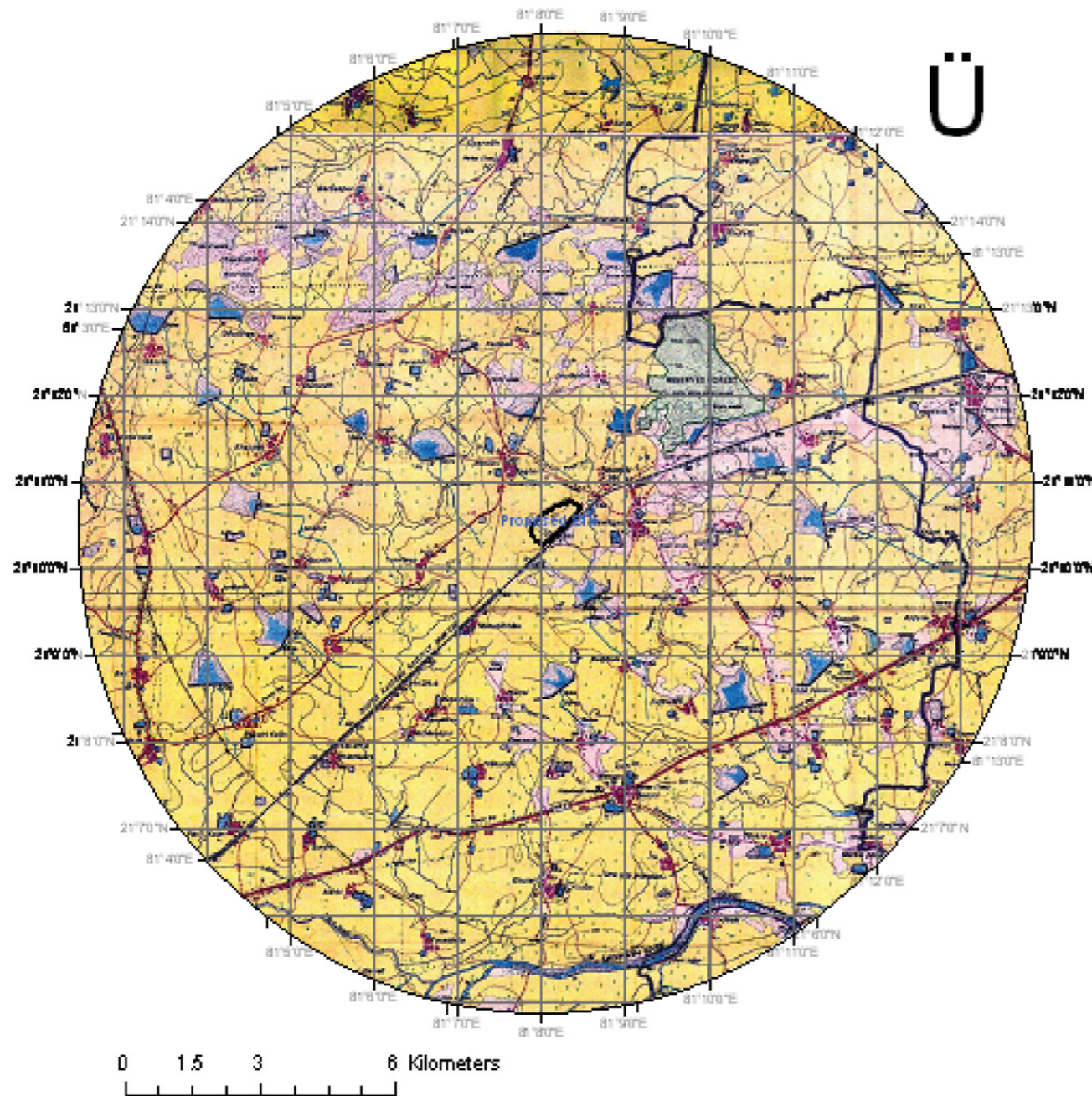


SUMMARY ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Proposed Cement Plant (Clinker 1.0 million tons/annum & Cement 1.52 million tons/annum) and 25 MW Captive Power Plant

at
Villages: Baghera, Nawagaon and Muripar
District: Rajnandgaon, Chhattisgarh



Map Showing Site & Surrounding 10 km Radius Area

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BY
MSP STEEL & POWER LIMITED

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1.0 Project Description

M/s MSP Steel & Power Limited (MSPL) proposes to establish a Cement Plant (Clinker production 1.0 MTPA & Cement production 1.52 MTPA) and 25 MW Captive Power Plant at villages Baghera, Nawagaon and Muripar, District Rajnandgaon of State Chhattisgarh.

The activity falls under Category A Serial 3 (b) of EIA Notification 2006. The Terms of Reference for the EIA study was approved by the Ministry of Environment & Forests, Government of India (MOEF) vide letter No. J.11011/237/2011-IA.II (I) dated 20th July 2011. The draft EIA report has been prepared for public hearing as per the TOR prescribed by MOEF.

Project Cost: The estimated project cost of proposed project is Rs 900 Crores.

Land Requirement: 269.3 acres land has been identified to establish the project. The identified land will be purchased directly from the landowner of Baghera, Nawagaon and Muripar. The land is single crop un-irrigated land under private holding. No forest land is involved. 33% land area shall be earmarked for greenbelt development.

Water Requirement: Water requirement for the project is 96 kl/hr (2300 KLD). Water will be sourced from Seonath River. Water is required for equipment cooling, drinking, sanitation, horticulture, etc. Water from the river will be pumped to the plant through dedicated buried pipeline system. Application for drawl of water from river has been submitted to Water Resource Department, Govt of CG.

Power Requirement: The total power requirement will be 25 MW. It will be sourced from Captive Power Plant. 2 x 1250 KVA DG is also envisaged for meeting the power demand during emergency shut down.

Employment: The construction of the project will require 22 months from zero date. 500 construction workers will be required per day to construct the project. 302 persons will

be required for the project operation. Local people will be preferred for employment during construction and operation phase.

Raw Material: Limestone, Gypsum, Iron ore fines and coal, is the raw materials required for the project. Limestone shall be brought from proposed Achholi- Hiratera lime stone mine of MSP. Achholi –Hiratera limestone mines is located in district Durg, which about 37 km away from proposed cement Plant. The transportation of Limestone shall be done by road. The details of raw materials, source and mode of transportation is given below.

Raw Materials Requirement

Sl No	Material	Quantity required	Source	Location	Transportation
Cement Plant					
1	Limestone	1.60 MTPA	Captive Mine	Achholi & Hiretara, Durg	By road
2	Gypsum	0.08 MTPA	Retail market	Rajasthan	By rail
3	Fly ash	0.45 MTPA	CPP and Nearby PP	--	--
4	Coal	0.18 MTPA	SECL/ e-auction	Korba (SECL)	By Rail
5	Iron ore	0.01	Own plant	Raigarh	By Rail
Power Plant					
6	Coal & Middlings	0.23 MTPA	SECL/ Imported E-auction	Korba, Raigarh (SECL)	By Rail

Process Description:

Cement Plant: In the clinker making process limestone and other raw materials are ground in raw mill, then mixed in defined proportion and fed to the kiln. Coal is grounded in coal mill and fed to kiln for firing. The calcined material is taken to clinker cooler. The cooled clinker is stored in silos. The clinker is grinded as cement in the cement grinding unit. Flyash is mixed with grinded clinker to make PPC.

Power Plant: In power plant high pressure steam is produced using pressurized boilers, which are fed to turbines for generating electricity. Middlings and coal shall be used as fuel in the FBC boiler to generate 25 MW power.

Internationally available best production and pollution control technology and management system will be implemented in the plant to prevent any damage to the surrounding environment.

Location: The Cement Plant is proposed to be located near Baghera, Nawagaon and Muripar villages, District Rajnandgaon, Chhattigarh. Nearest railway station is Muripar located about 1.0 km northeast of the plant site. Muripar railway station is situated on Nagpur - Howrah Broad Gauge line of South Eastern railway. The site is located adjacent to railway line for the purpose of developing railway siding. Distance from railway line shall be maintained as per Railway Rules. The site is well connected to National Highway (NH-6) through the state highway. NH-6 from Mumbai to Kolkata passes about 6 km away from the site in south direction. Nearest town is Rajnandgaon located about 12.5 km distance from the site in southwest direction. Nearest airport is at Raipur which is about 50 km from site.

There are no ecologically sensitive places like national park, wildlife sanctuary, tiger reserve, biosphere reserve within 10 km radius of the proposed plant site. Small patch of Reserved Forest is present near village Mangata which is located about 2.5 km north east of the plant site. Seonath River is located about 9.0 km away from the site in south direction. Nearest villages around the proposed plant site are Muripar, Baghera and Nawagaon. Muripar village is located about 0.6 km northeast, Nawagaon village is located about 1.5 km east and Baghera village is located about 1.4 km northwest of the site.

2.0 Description of Environment

Baseline environmental data generation of study area was carried out during the period 1st December 2011 to 29th Feb 2012. Data was generated by following the standards / approved procedures of the Ministry of Environment & Forests and the Central Pollution

Control Board. Study area of 10 km radial distance around the site has been considered for environmental baseline data generation.

Micro-Meteorological Environment: Historic met data was collected from India Meteorological Department. Met data was also generated at Muripar. The predominant wind direction is from north and northeast sector. The average wind speed ranges from 0.5 to 5.7 m/s. Daily mean temperature vary from 13.3°C to 27.5°C. The relative humidity varied from 39 - 60%. The annual rainfall is 1288 mm.

Air Quality: PM_{2.5}, PM₁₀, SO₂, NO₂, benzene, ozone, ammonia, carbon monoxide as well as Benzo(a)pyrene, As, Ni and Pb in PM₁₀ were monitored at eight locations in the study area. The locations were selected as per CPCB guidelines. Monitoring was done at upwind direction and various downwind directions of the proposed project. The baseline air quality levels of all parameters are found to be within the National Ambient Air Quality Standards prescribed for residential and industrial area. Benzo (a) pyrene, As, Ni and Pb in PM₁₀ are found to be within the National Ambient Air Quality Standards prescribed for residential and industrial area.

Noise Quality: Ambient noise levels were monitored at 8 locations in the study area, covering various area categories. The noise levels are well within the National Standards for residential, industrial and commercial area.

Water Quality: Eight surface water samples and eight groundwater samples were collected from the area for chemical and biological analysis. Surface water samples were collected from upstream and downstream point of Seonath river and other surface water sources. The surface water quality of Seonath river meets the designated use criteria. The surface water is fit for irrigation and industrial use. The surface water quality is fit for drinking only after conventional treatment. Groundwater samples were collected from handpumps and tubewells of villages around the project site. The groundwater quality meets the standards prescribed by Bureau of Indian Standards (BIS 10500 - 1991).

Soil Quality: Four soil samples were collected from the agriculture fields around the proposed project area and analyzed for relevant physico-chemical parameters. The

texture of soil is sandy clay loam. The organic matter, nitrogen, potassium and phosphorus content of the soil are found to be in moderate amount. The pH and conductivity of all the soil samples are well within the acceptable range.

Ecology: Tree species found in the study area are neem, seesam, bargad, pipal, sal, mahua, beeja, tendu, saja, semal, babul, siris, dhaura, palas, gulmohar, nilgiri, mango etc. Fox, mongoose, porcupine, jungle cat, langur, monkey, cobra, krait, rat snake, chameleon, and variety of birds are the common wildlife of the study area. No endangered species of plants and animals are found in the study area.

Sensitive Ecosystem: Within 10 km distance of the project site, no plant or animal species were found to be on the endangered list. No ecologically sensitive area like biosphere reserve, tiger reserve, elephant reserve, migratory corridors of wild elephant, national park and wildlife sanctuary are present within 10 km distance of the project site.

Socioeconomic Data: The proposed plant site is located in Rajnandgaon Tehsil of District Rajnandgaon in Chhattisgarh State. The 10 km area of the plant site falls in Tehsil Rajnandgaon of district Rajnandgaon and Durg Tehsil of District Durg. There are 72 villages a falls within the 10 km area of the proposed plant site. According to 2001 census total population of the study area is 89876 comprising 45503 male and 44373 female. Male female ratio of the study area is 975 female / 1000 male. Out of the total population about 12% is SC population and only 7 % is ST population.

3.0 Environmental Impact and Mitigation Measures

Water Quality: There will be no waste water generation from the cement making process. Other sources of wastewater generation from the plant are as follows:

- i) from cooling tower blowdown, DM plant regeneration and boiler blowdown of Captive Power Plant
- ii) from plant washings, workshop, laboratory, toilets and washrooms

Wastewater from all the streams shall be taken to guard pond and reused for dust suppression. The domestic effluent shall be treated in the Sewage Water Treatment Plant. Treated water will be used for gardening. Spent oil and lubricants will be collected in drums and sold to authorized reprocessors. Sedimentation basin with oil trap will be

provided in storm water drain. No wastewater will be discharged outside the plant premises.

Air Quality:

The major pollutants from the project will be dust, SO₂ and NO_x. Dust generation during vehicular movement in plant area will be suppressed using water sprinkling. Crusher will be provided with water sprinklers and bag filter to minimize dust generation. Bag house will be used to control dust pollution from raw mill and kiln. Tall stack will disperse the gaseous pollutants over wide area. Bag filter will be used in coal mill to control coal dust pollution. Electrostatic Precipitator will be used in clinker cooler to control dust pollution. Unit wise stack emission load and other details are given below:

Stack Emission Inventory from the Proposed Project

	Name of Unit, Control Equipment With	Stack height (m)	Stack top dia, m	Stack temp, (K)	Stack velocity (m/s)	Stack Emission Rate (g/s)		
						SPM	SO ₂	NO _x
1	FBC Boiler Stack ESP	80	3.0	413	20.0	5.1	80.0	51.0
2	Raw Mill & Kiln Stack Bag House	105	7.5	430	10.0	15.3	30.6	61.3
3	Coal Mill Stack Bag Filter	30	1.0	350	12.0	0.40		
4	Clinker Cooler Stack ESP	40	2.5	490	15.0	2.3		
5	Cement Mill ESP	40	1.2	323	7.0	1.1		
6	Dedusting systems (5 Nos.) Bag Filters	30	1.0	298	7.0	1.5		

Fugitive dust pollution from raw mill hopper, blending silos, kiln feed, clinker storage silos, truck loading machine and all transfer points and vents will be captured and controlled using bag filters. Conveyors and transfer points will be closed type. Water sprinkling arrangement will be provided around raw material stockpiles.

Mathematical modeling study proved that the maximum incremental ground level concentration of PM, SO₂ and NO_x from the plant will not violate the residential and industrial ambient air quality standard. The maximum impact of the air emissions will be observed in the SSW direction of the plant. The ambient air quality will remain well within

the prescribed standard hence it will not create any adverse impact on human health and ecology.

Impact of Air Quality & Percent Contribution by the Project (24-h avg in $\mu\text{g}/\text{m}^3$)

Parameter	Incremental MGLC	Baseline Value (maximum)	Superimposed value	National Standard*	% contribution by the project (maximum)
SO ₂	7.0	6.3	13.3	80	8.8
NO _x	6.8	12.6	19.4	80	8.5
PM _{2.5}	4.5	36	40.5	60	7.5
PM ₁₀	4.5	60	64.5	100	4.5

Noise Quality: Material handling operations and movement of trucks will be properly scheduled to minimize construction noise. The compressors, rotating machines, turbines, pumps, mill operations will be the main sources of noise. All activities will be carried out inside sheds and maintenance program for equipment will be routinely followed. Sound absorbing materials will be provided in the room where both the source and receiver are present so that the reflecting sound is absorbed. In noisy work areas soundproof duty rooms will be provided. Workers working in noisy areas will be given ear plugs and ear muffs. Dense greenbelt shall be developed all around the plant premises, covering 33% land area. In this manner the noise level will be restricted within the plant boundary and meet the standards of 75 dBA during day time and 70 dBA during night time.

Solid Wastes Disposal: The cement making process doesn't generate any solid waste. Dust collected from the air pollution control systems of plant will be reused in process. Ash generated from the CPP shall be reused for cement making. Garbage (plastic, paper, packaging material, etc) will be collected in containerized system and sorted out for recyclable materials, inert and biodegradable materials. Recyclable materials will be sold to kabadis. Inert materials will be used as landfill. Organic wastes will be composted.

Impact on Ecology: Dust emission will be controlled using ESP, Bag Filters and water sprinkling. Flue Gas will be dispersed using tall stacks. All air emissions will be kept within the prescribed standards. The incremental air pollution will not violate the air

quality standards. Wastewater and solid waste will be reused. Dense greenbelt shall be developed all around the plant premises, covering 33% land area. Greenery development will be done at all available open spaces will be made green. Such measures will continue during the expansion phase, which will be adequate to protect the ecology of the area.

Impact on Public Health: Air quality modeling study proved that the due to adoption of efficient air pollution control devices the air quality will remain well within the ambient air quality standard. The national ambient air quality standards prescribe level of air pollutants that will protect public health and vegetation. No toxic chemicals or wastes will be handled in the plant and mines. Oil will be stored in tanks as per standard approval. Hence there will be no risk to public health.

Landform: No building materials will be extracted from the project site. Excavated earth will be used for leveling and backfilling of civil foundations. It will be ensured that drains and garland drains are constructed conforming to the existing drainage pattern so that alteration is kept to the minimum and flooding does not occur.

Greenery Development: Site clearing is not required. While planning the layout it has been ensured that the existing trees are retained. 33% land shall be developed as greenbelt. About 83600 trees, shrubs and herbs shall be planted on 88 acres land area.

Impact on Traffic Movement: All raw materials and cement except Limestone shall be brought from proposed Achholi- Hiratera lime stone mine of MSP. Achholi –Hiratera limestone mines is located in district Durg, which about 37 km away from proposed cement plant site. The transportation of Limestone shall be done by road. Limestone will be transported by dumper trucks. This will increase the daily traffic movement by 15 trucks/ dumpers daily (one side). The existing road capacity and condition is adequate to bear the additional traffic load. The existing road will be strengthened by MSP in consultation with the local administration and panchayat samitis.

4.0 Environmental Monitoring Plan

Environmental Management Department (EMD): Full-fledged EMD shall be created. EMD shall be placed under the direct control of Chief Executive of the plant. Separate full fledged environmental laboratory shall be created. Qualified and experienced Scientists and Engineers shall be recruited in the EMD.

Activities of EMD: EMD will perform the following activities:.

1. Regular monitoring of stack emissions, fugitive emissions work environment and report any abnormalities for immediate corrective measures.
2. Regular monitoring of ambient air quality at plant boundary and outside the plant in upwind and downwind direction.
3. Regular monitoring of re-circulating water quality, ground water quality and surface water quality.
4. Regular noise monitoring of the work zone, equipments and outside the plant.
5. Green belt plantation, maintenance, development of other forms of greenery like lawns, nursery, gardens, etc. in the plant premises.
6. Regular monitoring of quantity and quality of solid waste and their reuse options.
7. Development of schemes for water conservation, rain water harvesting and reuse of treated wastewater.

5.0 Additional Studies

Risk Mitigation Measures: Necessary risk mitigation measures, including firefighting measures will be implemented. Hazards due to mechanical injury will be reduced by use of standard design and operating procedures. Oil tanks will be located and designed as per the guidelines of Oil Industry Safety Directorate. All necessary safety measures shall be provided. Disaster Management Plan shall be implemented in consultation with the District Administration to take care of health and safety during any untoward incident.

Rehabilitation: Financial compensation as per Chhattisgarh Government prescribed Rate shall be paid to land owners, whose land shall be acquired for the project. Rehabilitation of project affected persons will be done as per the Policy of Chhattisgarh Government. Preference will be given to land losers for employment in the project (for operation as well as for construction of the plant). They will be recruited as per their skill and experience.

Occupational Health: The workers will be routinely checked for any clinical complaints and abnormal symptoms by the medical department. The hospital shall be established in the plant. This will be equipped with doctors, medicine, ambulance and other medical equipment to take care of emergency cases. Workers will be given nose mask, ear plugs, clean drinking water and toilet facility. Regular training and awareness programs will be conducted.

6.0 Project Benefits

Direct Benefits: The project will overcome the demand and supply gap of cement in the country. The project will also generate additional revenue for the State Government. The additional cement availability will boost the infrastructure sector and the overall economic scenario of the country. The project will create direct employment for 500 people during the construction phase of 22 months. About 302 people will be directly employed in the plant during operation phase. Local people will be preferred for employment during the construction and operation stage.

Community Development Spending Benefits: MSP shall spend Rs.45 crores for various socio-economic and community development activities in surrounding villages. The activities cover education, health, infrastructure, culture and sports, skill development and training and women empowerment. This money will be spent in the surrounding villages. Details of CSR activities are provided in section 6.3 chapter 6 of the EIA report.

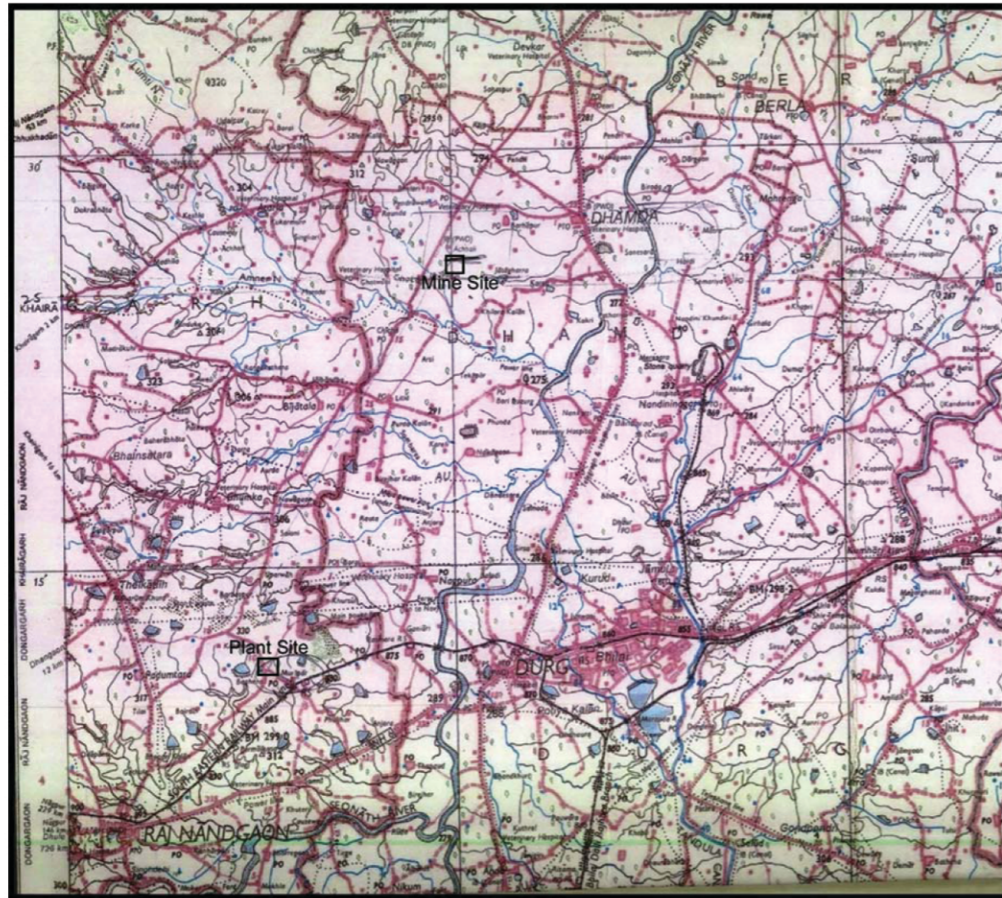
7.0 Environmental Management Plan

Environment Management Department will implement the EMP of this project. All recommendations given in the EIA report including that of occupational health, risk mitigation and safety will be complied with. The capital cost required to implement the pollution control systems and EMP will be Rs.90 crores. The annual recurring expenses will be Rs.20.0 crores. .

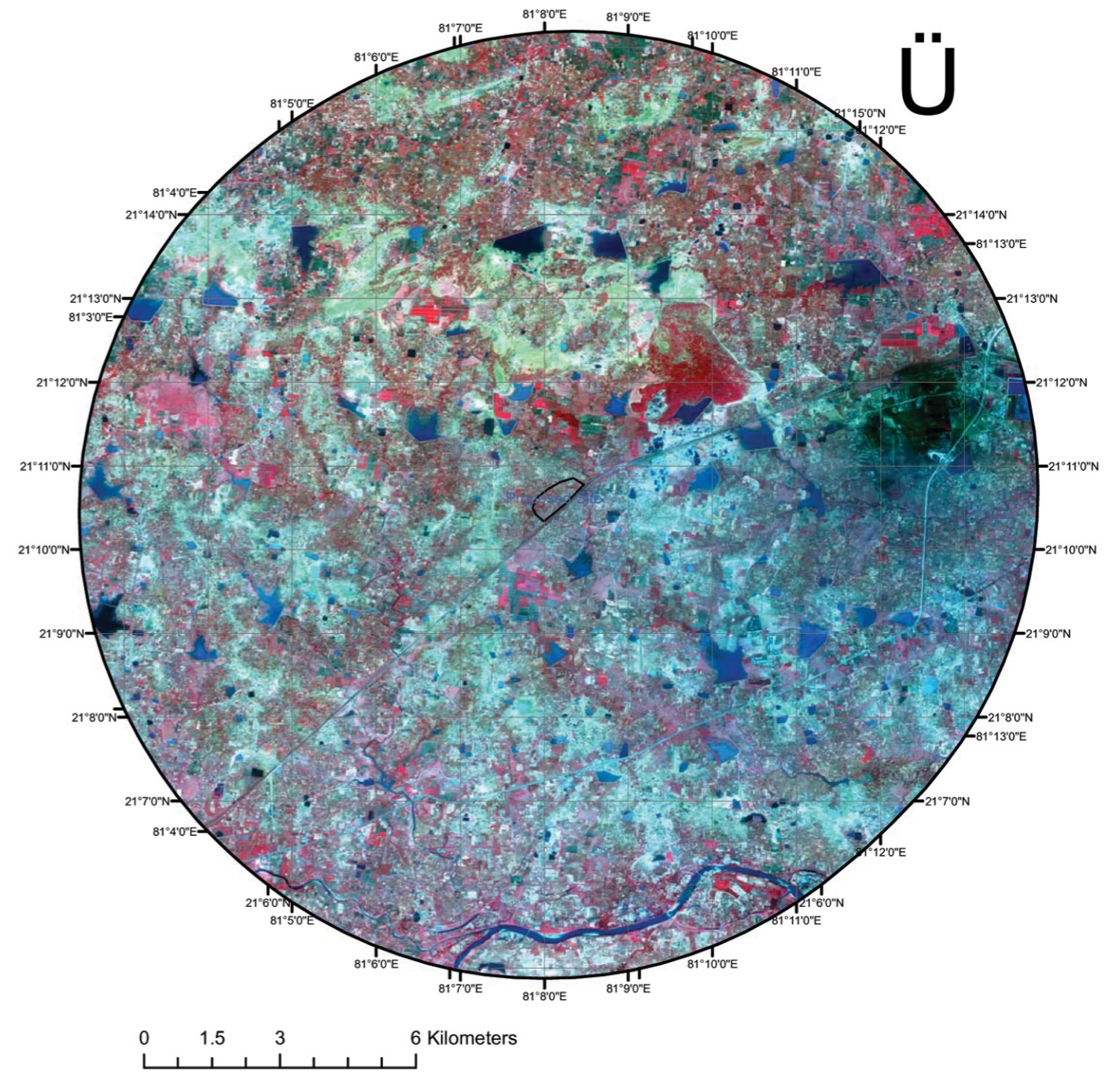
EMD will ensure that all air pollution control devices, effluent treatment plant and water re-circulating systems function effectively. Schemes for resource conservation (raw materials, water, etc), rainwater harvesting and social forestry development will be taken up by EMD. Greenery development on 33% land will be ensured. Guidelines issued by the Central Pollution Control Board (CPCB) on greenbelt development will be followed and district forest department will be consulted for selection of trees.

Environmental awareness programs for the employees will be conducted. EMD will also ensure cleanliness inside the plant. All records shall be submitted to the regulatory authorities (Central and State Pollution Control Board), displayed at relevant places like company gate and website and maintained by the EMD.

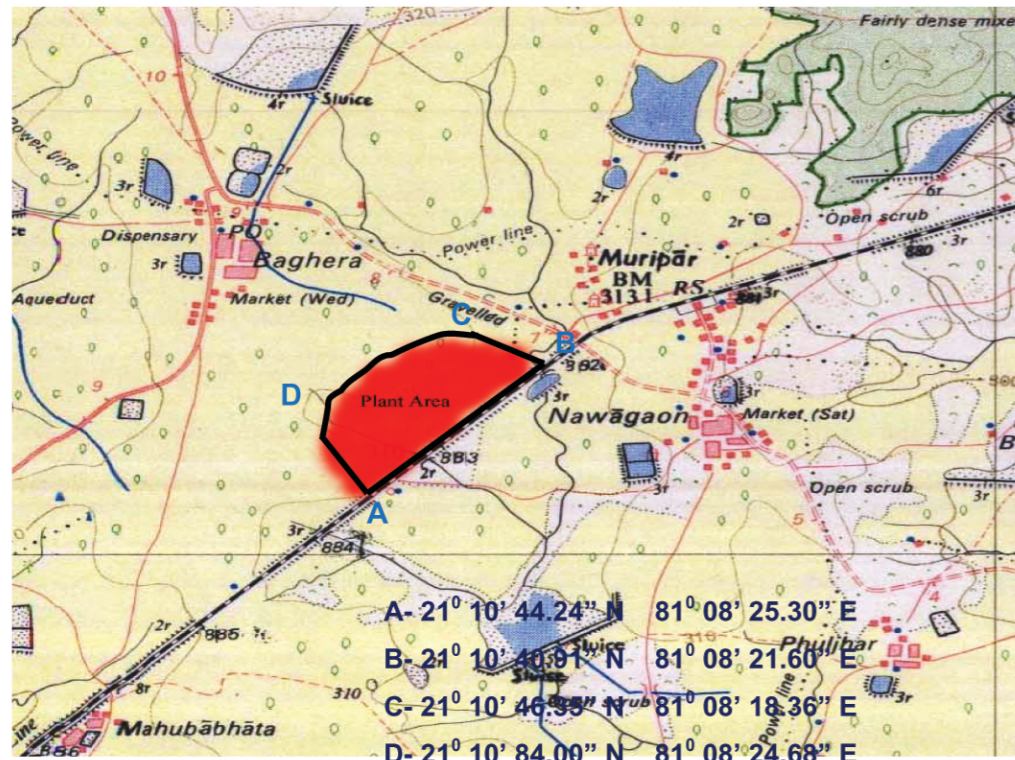




Map showing Location of Cement Plant as well as Acholi Mine



Land use & Land Cover Map



Map Showing Plant Boundary & Coordinates

A- 21° 10' 44.24" N 81° 08' 25.30" E
 B- 21° 10' 40.91" N 81° 08' 21.60" E
 C- 21° 10' 46.95" N 81° 08' 18.36" E
 D- 21° 10' 84.00" N 81° 08' 24.68" E