1.0 INTRODUCTION

1.1 PURPOSE

The Environmental Impact Assessment (EIA) report is prepared in order to assess the environmental impacts due to the proposed 2 x 2 MTPA Cement Grinding Unit with Bulk Loading Terminal facility & 2 x 50 MW Captive Power Plant (CPP) at Ahuj (A) & Alegaon Villages, South Solapur Taluka, Solapur District, Maharashtra State.

The application to prior Environmental Clearance (Form-1) for the proposed project was considered by the State Expert Appraisal Committee in its 60th meeting held on 28th September 2012, for determination of the Terms of Reference (ToR) for preparation of the Environmental Impact Assessment (EIA) report. The Committee has suggested specific Terms of Reference (ToR's) for preparation of the EIA report and Environmental Management Plan vide its file no. SEAC 2011/CR 146/TC2.

This Environmental Impact Assessment (EIA) report is prepared for obtaining Environmental Clearance (EC) from the State Level Environmental Impact Assessment Authority, Maharashtra and the Consent for Establishment (CFE) from the Maharashtra State Pollution Control Board (MSPCB) for the proposed Cement Grinding Unit and Captive Power Plant project

1.2 IDENTIFICATION OF PROJECT

Chettinad Cement is intending to penetrate into the Western and Central Market of our country, to make its presence PAN INDIA. Accordingly , It is proposed to put up a Cement Grinding Unit of 4 (2 x 2) MTPA capacity with Bulk Loading Terminal and 100 (2 x 50) mw Captive Power Plant at Ahuj (A), Alegaon Villages, South Solapur District, Maharashtra,. By taking Clinker from Chettinad's Kallur Integrated Cement Plant in Karnataka and Fly Ash from any nearby Thermal Power Plants/ Solapur (NTPC)/Chettinad's Captive Power Plant , it is planned to produce Portland Pozzolana Cement (PPC) & Ordinary Portland Cement (OPC) to meet the market needs in and around Maharashtra State.

1.3 BRIEF DESCRIPTION OF PROJECT

1.3.1 Nature of the Project

As per EIA notification September 14th, 2006 and its amendments 2009, the Cement Grinding Unit falls under 3(b) of Category B & Power Plant under 1(d) and need prior environmental clearance.

1.3.2 Size of the Project

The proposed grinding unit has an installed capacity of 2 x 2 MTPA with Bulk Loading Terminal Facility and 2 x 50 MW Captive Power Plant. The proposed Cement Grinding Unit will utilize Fly Ash generated from any nearby Thermal Power Plants/ Solapur (NTPC)/Chettinad's Captive Power Plant and mineral Gypsum

from Mumbai for manufacturing Portland Pozzolana Cement (PPC) & Ordinary Portland Cement (OPC).

1.3.3 Cost of the Project

Total cost of the proposed project is Rs. 660.75 crores

2.0 PROJECT DESCRIPTION

2.1 LOCATION OF THE PROJECT

The proposed Grinding Unit is proposed to be located at Ahuj (A) and Alegaon Villages, South Solapur Taluka, Solapur District of Maharashtra State. The proposed project area lies at North Latitude 17^0 31′ 28.52″ to 17^0 32′ 13.89″ & East longitude 76^0 02′ 8.5.88″ to 76^0 02′ 35.2″. The environmental setting of the site is presented in **Table-2.1**.

TABLE 2.1
ENVIRONMENTAL SETTING

Sr.no	Particulars	Details
1.	Project Location	Ahuj (A) & Alegaon Villages, South Solapur Taluka, Solapur District of Maharashtra State.
2.	Latitude/Longitude	North Latitude 17^0 31′ 28.52″ to 17^0 32′ 13.89″ & East Longitude 76^0 02′ 5.88″ to 76^0 02′ 35.2″
3.	Location covered in Toposheet No	56 C2, 56 C3, 47 O/14 & 47 O/15.
4.	Climatic Conditions	IMD data, SOLAPUR: Temperature: Max: 37.9 °C (May), Min:14.4° C (Jan) Relative Humidity : Max: 82 % , Min : 22 % Mean Annual rainfall : 759.8 mm
5.	Site elevation above Mean Sea Level	from 457 m to 470 m above MSL
6.	Land use at the proposed project site	Single crop agricultural land and partly barren land.
7.	Site topography	Flat
8.	Nearest roadway	State Highway, SH-151 (~6.85 Km, in NE direction)
9.	Nearest Railway Station	Tilati Railway Station (~1.95 KM, SE)
10.	Nearest Railway line	South Central Railway Main Line connecting Mumbai and Banglore (~ 10 m, SW)
11.	Nearest Air Port	Hyderabad (~ 240 km, E)
12.	Nearest village/major town	Solapur (~20 km, NW)
13.	Hills/valleys	No major hills and valleys observed within 10 km radius
14.	Ecologically sensitive zone	No notified ecologically sensitive zones within 10 km radius
15.	Nearest Reserved/Protected	None within 10 km radius area

Sr.no	Particulars	Details
	forests	
16.	Historical/tourist places	None within 10 km radius area
17.	Nearest Industries	Birla Cement Industry (~4.52 Km) NW NTPC (under construction) (~5.41 km) in WNW Sugar Factory (~12.81Km) in NW
18.	Nearest water bodies	Dhubdhubi Odha River (~1.90 Km) in NW
19.	Seismic zone	Zone –III as per IS: 1893 (Part-1) 2002

Source: EIA Studies, Anacon Laboratories Pvt. Limited.

2.2 MAGNITUDE OF OPERATION

The proposed 2 x 2 MTPA grinding unit is designed for producing Portland Pozzolana Cement (PPC) and Ordinary Portland Cement (OPC). using the Clinker, Fly ash and Gypsum. A Captive Power Plant 2 x 50 MW capacity is also proposed to be set up.

A condensed description of various utilities required for the proposed project is given in **Table-2.1**.

TABLE-2.2
DETAILS OF THE PROJECT

Sr. No.	Parameter	Description
1.	Plant Capacity	Cement Grinding Unit : 2 x 2 MTPA Captive Power Plant : 2 x 50 MW
2.	Product	Portland Pozzolana Cement (PPC) Ordinary Portland Cement (OPC)
3.	Project Cost	Rs.660.75 lakhs
4.	Land Requirement	Total Plant area : 538900 sq m
5.	Water requirement and Source	Water requirement : Source Bore wells: 600 m3/day Bhima River Water: 2000 m3/day
6.	Raw material requirement	Clinker : 3.80 MTPA Gypsum : 0.2 MTPA Flyash : 1.2MTPA Coal (for CPP) : 0.6 MTPA
7.	Power requirement and source	34.4 mw Source : Maharashtra State Electricity Board (MSEB) until proposed captive power plants (2 x 50 MW) is commissioned
8.	Mode of transport of raw materials and finished products	Road transport by trucks and and rail
9.	Total Manpower requirement	500 (including both direct and indirect)

Source: Project Report

The details pertaining to proposed Captive Power Plant is given in **Table-2.2**.

TABLE-2.3
DETAILS OF THE PROPOSED CAPTIVE POWER PLANT

Sr. No.	Features	Description
1	Capacity	100 MW
2	Configuration	2X50 MW
3	Type of boilers	Fluidized Bed Combustion (CFBC) Boilers
4	Power evacuation	Through SEB/PGL transmission line
5	Fuel	Coal
6	Source of Coal	70% Imported Coal and 30% Indigenous Coal; producured from open market
7	Coal Requirement	0.6 MTPA 70% Imported Coal and 30% Indigenous Coal Imported Coal – 0.4 MTPA and Indigenous Coal - 0.2 MTPA
8	Sulphur content	Imported Coal- 0.6 % max Indigenous coal- 0.5 % max
9	Ash Content in Coal	Imported Coal- 12 % max Indigenous coal- 45 % max
10	Ash generation	387 TPD, entire Fly Ash generated will be used in cement manufacturing
11	ESP efficiency	>99.93%
12	Stack height	One common bi-flue stack of 100 m height

2.3 MANUFACTURING PROCESS

a. Cement Grinding

This is a Greenfield Project, proposed to be set up to cater to the demand of Cement in the western central region. The basic raw materials for Cement Grinding Unit are Clinker, Gypsum and Fly Ash. The Clinker received by rail/road will be stored in closed silos of adequate capacity.

Closed Storing facility for Gypsum and Fly Ash will be provided to avoid pollution. The additives will be unloaded with the help of tippler.

Additives will be extracted with the help of apron conveyor and transported to stockpile through traveling stacker. Additives will be reclaimed with the help of side reclaimer and transported to cement mill hopper.

Dry Fly Ash received in closed bulkers will be pneumatically pumped to silos and will be transported through air slide and bucket elevator to Cement Mill with dust filters at each transfer-point to control pollution.

Ball Mill /Roller Press of adequate capacity will be used for clinker grinding. Cement mill will be dedusted with the help of bag house.

b. Captive Power Plant (CPP)

The whole process comprises of generating heat energy in the boiler and then converting heat energy generated in the Boiler into mechanical energy in the turbine and further converting this mechanical energy generated in the turbine into electrical energy in the alternator.

Raw coal from coal storage yard will be fed to the boiler through the closed coal conveyors with bag filters at coal transfer points to control the dust emission. Coal will be used as fuel in the boiler. The combustion of the fuel generates the heat energy in the boiler. This heat energy is transferred to heat transfer area provided in different areas like (bed coils, water wall, bank tubes, economizer, super heater, air pre-heater). This heat will be transferred to the water which will pass through and steam is generated and this steam will be further heated by super-heated coils so that dry super-heated steam (515^0C @86 kg/cm^2 ata) will be generated.

The steam generated in the boiler at 86 kg/cm^2 pressure and 515^0C temperature is fed to the Turbo generator and this steam expands in the turbine and generates mechanical energy i.e., it starts rotating the Rotor at high speed and further this mechanical energy will be converted into electrical energy in the alternator. The power generated in the turbo-generator is distributed to Cement Plant, and for the auxiliary consumption in the Captive Thermal Power Plant.

The main steam in the turbine is made to pass through the condenser where the steam gets condensed and this condensate is pumped to the feed water tank and then to deaerator tank from where it is pumped to the boiler through the feed water pumps. Air cooled condensors are planned to cool the steam from the Turbine .The RO/DM Plant water is used for making up the loss due to blow down and other losses from Boiler. The Captive Power Plant is equipped with all latest and most modern energy efficient systems like centralized Digital Control System, Soft starters, Variable Frequency Drives, Electrostatic Precipitator (ESP), etc.

3.0 BASELINE ENVIRONMENTAL STATUS

The baseline environmental quality data was collected as per CPCB norms for various components of environment, viz. Air, Noise, Water and Soil from 1st October 2012 to 30th December 2012 representing Post Monsoon and winter Seasons in the study area covering radial distance of 10 km around the proposed site.

3.1 LAND USE STUDIES

The Land use pattern of the study area details given in **Table 3.1**. The following prominent land use pattern has been observed in the study area.

TABLE-3.1
BREAKUP OF LANDUSE BASED ON SATELLITE IMAGERY

S. No.	Land Use	Area (ha)	Total area (ha)	Percentage	Total Percentage
Built-up Land					
1.	Settlements	509	922	1.39	2.5
2.	Industry/Institutional area	413		1.13	
Agricultural Land					
3.	Plantation	110	33547	0.30	91.5
4.	Double crop/irrigated area	6504		17.74	
5.	Other Agriculture area	26221		71.52	
6.	Fallow land	713		1.94	
Waste land					
7.	Land with scrub	208	1790	0.57	4.9
8.	Land without scrub	1570		4.28	
9.	Quarry/Mining Area	12		0.03	
Water Body					
10.	Stream/River/Tank/Reservoir	403	403	1.10	1.1
Total		**36663**		**100**	

Source: Data collected from IRS-P6:LISS3

3.2 SOIL ENVIRONMENT

The soil samples were collected from 8 locations in core/Buffer Zone covering various land uses and compared with the standard soil classification. The observation indicates that the soils are moderately fertile and support the vegetation life in the region.

3.3 TERRESTRIAL ECOLOGY

Studies on flora and fauna of the area had been carried out both for the core zone and buffer zone. Detailed studies were carried out for assessing the diversity pattern of the floral species. Faunal pattern of the area was studied by making inquiries to the local population and forest officials and by personal observation

3.4 METEOROLOGY

The meteorological data recorded during the monitoring period shows the predominant wind direction as South East, followed by East. Historical data on meteorological parameters will also play an important role in identifying the general meteorological regime of the region

AMBIENT AIR QUALITY

To establish the baseline status of the ambient air quality in the study area, the air quality was monitored at 8 locations. The PM_{10},$PM_{2.5}$, SO_2, and NO_x levels are found to be well within the CPCB standards.

3.5 NOISE ENVIRONMENT

A preliminary reconnaissance survey has been undertaken to identify the major noise generating sources in the area. Eight locations were identified based on the activities in the village area, traffic and sensitive areas like hospitals and schools. All the observations were found to be within the CPCB limits.

3.6 WATER QUALITY

The water quality in 10 Km radius was assessed at 2 locations for surface water and 7 locations for ground water. The water quality was found to be uncontaminated and free from industrial pollution.

4.0 ANTICIPATED ENVIRONMENT IMPACT ASSESSMENT & MITIGATION MEASURES

4.1 ENVIRONMENTAL IMPACTS DUE TO REGULAR OPERATIONS

During operation phase, the impacts on the various environmental attributes will be mitigated using appropriate pollution control equipment. The Environment Management Plan has been prepared for the proposed project, which aims at minimizing the pollution at source.

4.2.1 Impact on Air Quality – Point Emission Sources

The sources of air pollution in the process due to the proposed plant facilities have been identified and quantified. The contribution from the other nearby operating industries and their activities have also been captured during the ambient air quality surveycarried out for baseline monitoring. The incremental ground level concentrations from the proposed facilities have been estimated by using dispersion modeling.

The predictions indicate that the resultant concentrations of particulate matter, SO2 and NOx are found within the prescribed limits for industrial, residential and rural zone.

4.2.1 Air Environment Management

- Provision of dust extraction systems at dust generating source
- Design of control equipment to meet the standards stipulated by CREP
- Online flue gas monitors for the stack
- Provision to store the Gypsum in covered sheds and conveyed by fully closed conveying belts thereby reducing the fugitive emissions

- Fly Ash will be brought through bulkers and stored in silo.
- The Gypsum and Fly Ash will be conveyed by fully covered conveying belts thereby reducing the fugitive emissions.
- Providing Bag Filters designed to ensure emissions below 50 mg/Nm^3
- Packing of the cement by automatic machines, which will be equipped with Bag Filters to control emissions
- Provision of water sprinkling system at raw material storage yard
- Asphalting of the roads within the plant area
- Developing of Greenbelt around the plant to arrest the fugitive emissions

4.2.2 Impact on Water Resources & Quality

The quantity of water required for the proposed plant is 1840 m^3/day. The water requirement of 600 m3/day for the proposed unit will be met from the bore wells initially and then from Bhīma River (19 km, S).

Total wastewater (including domestic wastewater) generation of entire project will be reused. The proposed plant will be operated based on zero discharge concepts.

4.2 IMPACT OF SOLID WASTES

The proposed project of Cement Grinding Unit is a non-hazardous process, which will not generate any solid waste, hazardous waste or waste water either in the process or pollution control facilities during operation. All the dust collected in Air Pollution Control Equipment is automatically recycled into the process.

Fly Ash generated from the CPP shall be utilized in cement manufacturing of Pozzolana Cement. A portion of the Bottom Ash generated will be screened and used a bed material for the Boiler and the balance will be used for road formation and in low level areas. The sludge generated from the SWRP will be used as manure for greenbelt development.

4.3 IMPACT OF NOISE

Once the plant becomes operational, noise will be generated from the cement mills, packing unit, conveyors etc. In case of captive power plant noise generating stationary sources from the power plant will be pumps, compressors along with cooling tower and boilers. The noise levels at the source for these units will be in the range of 80-90 dB (A). The noise dispersion from the plant units has been computed based on the mathematical model.

The green belt that will be developed around the perimeter of the plant will attenuate the noise emitted by the various sources in the Unit.

Apart from this, the following steps are recommended for reduction in noise levels:

- Frequent lubrication of pumps will be undertaken
- Providing noise proof cabins to operators where remote control for operating noise generating equipment is feasible.

4.4 BIOLOGICAL ENVIRONMENT

As the pollution loads coming out of the stack are negligible, there is no major impact on flora in and around the project site.

Chettinad Cement will develop sufficient greenbelt around the periphery of the project area to reduce impact of air pollution in surrounding due to project activity.

Extensive plantation comprising of pollutant resistant trees will be undertaken in and around the project site which will serve not only as pollution sink but also as a noise barrier. It is expected that with adoption of these mitigatory measures, the impact due to operation of the plant will be minimal on the terrestrial ecosystem.

The company will take all the reasonable precaution during the construction as well as operation phase of the project.

4.5. PLANTATION/GREENBELT DEVELOPMENT

Total plantation in the plant will spread over an area of 18.0 ha, which is about 33% of the total plot area of 53.89 ha. The plantation will be developed and maintained around the plant site.

5.0 ANALYSIS OF ALTERNATIVES

5.1 SITE SELECTION

The project is proposed to be located in Ahuj (A) and Alegaon Villages, of South Solapur Taluka, Solapur District in Maharashtra. The proposed project site has been selected and identified based on the following considerations:

- Site Location
- Proximity to the market
- Road network (Well-linked through SH-151)
- Availability of clinker
- Availability of fly ash
- Power feasibility
- Availability of water
- Market Demand

6.0 ENVIRONMENTAL MONITORING PROGRAMME

The attributes, which require regular monitoring, are specified underneath:

- Air quality
- Ground water, Surface Water and wastewater quality
- Noise levels
- Soil quality

Incorporation of the mitigative measures is a one time work. All the mitigative measures will be operated continuously and efficiently to ensure that all guidelines applicable for the plant are effectively met.

6.1 POST MONITORING OF ENVIRONMENT MANAGEMENT SYSTEM

- Examination of all air pollution control system with due respect to its performance regularly
- Maintenance of records for verification by regulatory authority
- Examination and regular cleaning of raw material and fuel handling area
- Examination of rainwater harvesting systems and storm water drains
- Regular monitoring of ground water level and quality
- Checking the quality of ambient air by drawing regular air samples and getting them analyzed.
- Maintenance of the record of plantation to monitor plantation scheme, the area of plantation, the observance of growth rate and survival of plants.

7.0 ADDITIONAL STUDIES

Risks and hazards from the project have been identified and appropriate Managemnet Plans are in place.

8.0 PROJECT BENEFITS

The proposed project will result in improvement of infrastructure as well as up liftment of social structure in the area. The people residing in the nearby areas will be benefited directly and indirectly as well. It is anticipated that the proposed plant will provide benefits to the locals in two phases i.e. during construction phase as well as during operational phase of the plant.

8.1 IMPROVEMENTS IN THE PHYSICAL INFRASTRUCTURE

Management of Chettinad Cement Corporation Limited is aware of and concerned about the health and safety of not only its own employees and their families but also about the ecology and issues affecting society around their plants. As a corporate citizen it has always been the endeavor of group to take effective steps to tackle all these issues. Following improvements in the physical infrastructure are envisaged:

- Condition of roads: As the transportation of all the raw materials and finished product will be through road, the unit will have liaison with the concerned Government department for maintenance/up gradation of the road.
- Condition of education facilities: The unit will contribute to the construction/maintenance of school buildings in the nearby villages.
- Condition of medical and health care: The Company will have MOU with nearby hospitals/nursing homes for day to day and annual checkup and treatment of employees, their family and others.
- Conditions of other infrastructural facilities: Infrastructure facilities like transport, drinking water, health and hygiene will also be improved

8.2 IMPROVEMENTS IN THE SOCIAL INFRASTRUCTURE

To implement this, the project proponent proposes to launch several projects / schemes.

- Education - Free education and books & notes for the students of deprived sections. Support scholarship scheme, tutions, etc. are other facilities.
- Promoting Sports & Cultural activities
- Health camps in surrounding areas

9.0 EMP IMPLEMENTATION PROGRAM

All the Management Programme will be implemented and documented to serve the following purposes:

- Identification of environmental/safety problem, which may occur in the plant or surrounding area
- Initiating or providing solutions to those problems through designated channels and verification of the implementation status
- Control of activities inside the plant, until the environmental/safety problem is corrected

  Suitably respond to emergency situations. Provide details of the emergency and the actions taken to the top management suitably make modifications or alterations in the plant to meet regulatory standards as amended from time to time.

10.0 SUMMARY AND CONCLUSIONS

The annual demand for Cement in India is consistently growing at 8-10%. The capacity of Cement industries in the country is 300 million tons per annum. At the same time, the demand will be going up by 20 % in last 2 years.

The proposed project will have insignificant impacts on the local environment. The impacts will be minimized to a great extent with proper mitigation measures and effective implementation of the environment management measures suggested in the EIA/EMP report and as recommended by MoEF, CPCB and MPCB.

However, development of this project has beneficial impact in terms of growth in regional economy. The project will increase Government earnings and revenues and accelerate the pace of industrial development in the region.

The proposed project will generate direct and indirect employment to a large number of personnel. The project will also encourage ancillary industries in the region, which will not only increase the employment potential but also strengthen the economic base of the region.

Thus, in view of considerable benefits from the project, the proposed project is most advantageous to the region as well as to the nation.

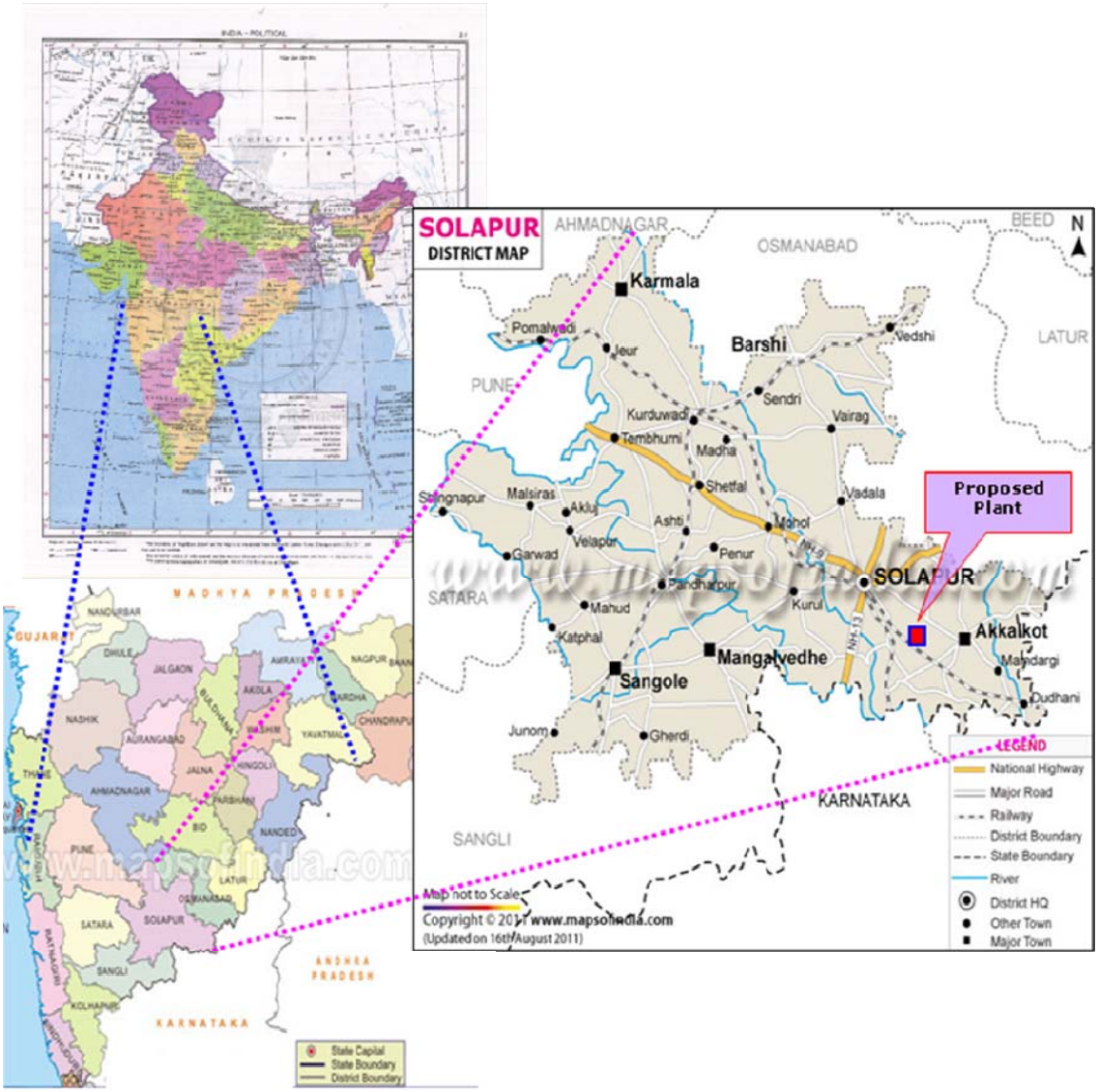
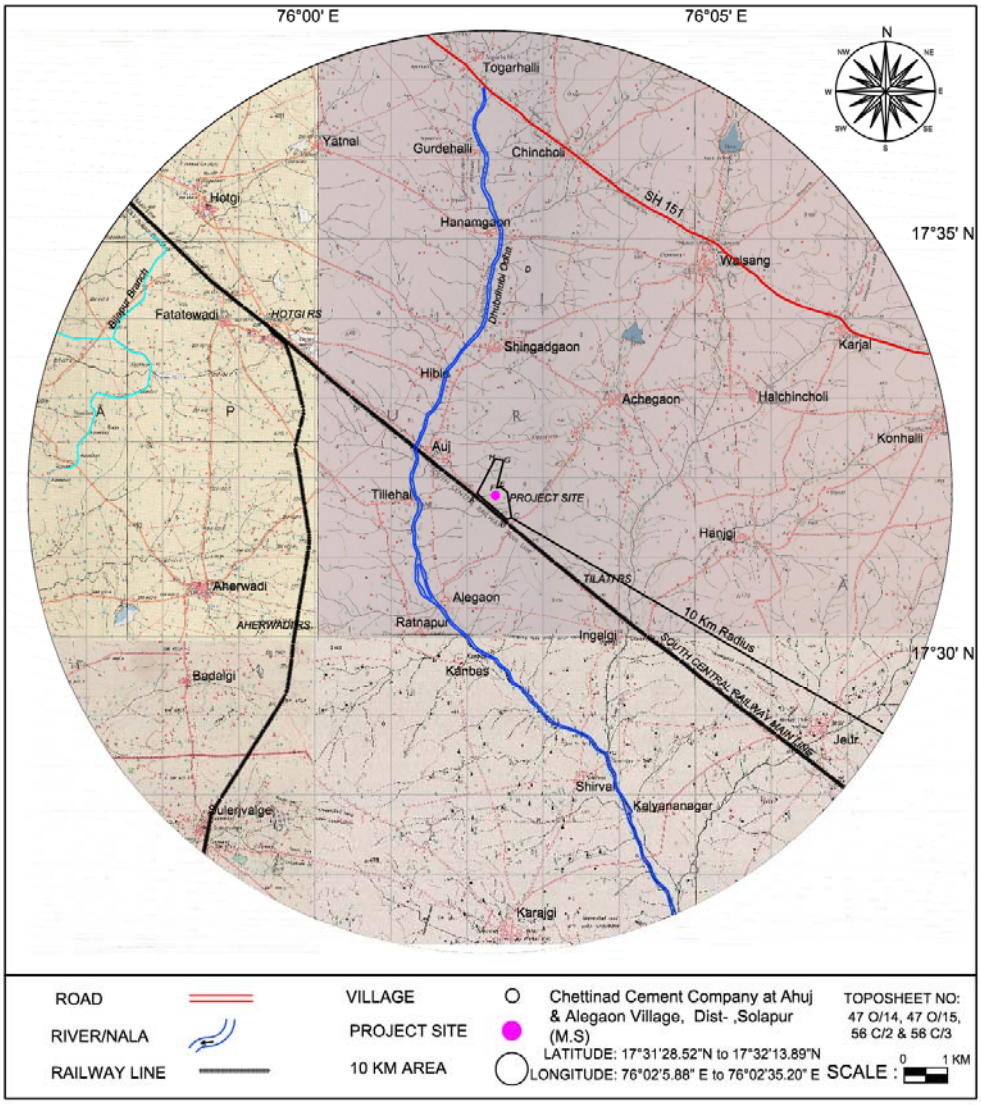


FIGURE 1
INDEX MAP SHOWING THE PROJECT SITE



Sr. No.	Name	Way Point	Proposed Site Co-ordinates	
			Latitude	Longitude
1.	A	468	17°31'48.19"N	76° 2'5.88"E
2.	B	470	17°31'28.52"N	76° 2'31.83"E
3.	C	476	17°31'29.65"N	76° 2'35.20"E
4.	D	477	17°31'49.13"N	76° 2'31.79"E
5.	E	479	17°31'52.83"N	76° 2'26.43"E
6.	F	480	17°31'51.96"N	76° 2'23.29"E
7.	G	481	17°32'13.44"N	76° 2'29.01"E
8.	H	482	17°32'13.89"N	76° 2'22.16"E

FIGURE-2
LOCATION MAP OF THE PROJECT AREA (10 KM RADIUS)