

EXECUTIVE SUMMARY
OF
ENVIRONMENTAL IMPACT
ASSESSMENT REPORT
FOR
PUBLIC HEARING
OF

Proposed Expansion of Integrated Cement Plant

Clinker (2 x 1.5 to 2 x 2.6 Million TPA),
Cement (2 x 2.6 to 2 x 3.0 Million TPA),
Waste Heat Recovery Power Plant (15 to 30 MW),
Captive Thermal Power Plant (25 MW)
along with Synthetic Gypsum Unit (65 TPH) and DG Sets
{2000 KVA (size 1000/500/250/125)}

Near

Village : Khapradih, Tehsil : Simga,
District : Balodabazar-Bhatapara (Chhattisgarh)

APPLICANT



Shree Raipur Cement Plant

(A Unit of Shree Cement Ltd.)

Post Box No. 33, Bangur Nagar,

Andheri Deori, Beawar, Distt. Ajmer (Raj.)

Phone No. - 01462-228101-6

E-mail: bhargavr@shreecementltd.com

INDEX

S.No.	Particulars	Page No.
1.0	Project Description	1
1.1	Introduction	1
1.2	Brief Description of the Project	1
1.3	Location Map	3
1.4	Major Requirements for proposed Expansion Project	4
1.4.1	Raw Material Requirement	4
1.4.2	Fuel Requirement	4
1.4.3	Other Basic Requirement	5
1.5	Manufacturing Process	5
1.5.1	Cement Plant	5
1.5.2	Captive Power Generation Process (Air-Cooled)	6
1.5.3	Synthetic Gypsum Plant	6
1.5.4	Waste Heat Recovery Power Plant (30 MW)	6
2.0	Description of Environment	6
2.1	Presentation of Results (Air, Noise, Water & Soil)	6
2.2	Biological Environment	7
2.3	Socio-Economic Environment	7
3.0	Anticipated Environmental Impacts and Mitigation Measures	7
4.0	Environmental Monitoring Programme	8
5.0	Additional Studies	9
6.0	Project Benefits	9
7.0	Environment Management Plan	9

EXECUTIVE SUMMARY

1.0 PROJECT DESCRIPTION

1.1 Introduction

Shree Cement Limited (SCL) is the largest producer of cement in Northern India with a production capacity of 23.6 million tonnes per annum. It started its operations in 1985 with 0.6 million ton capacity at Bangur Nagar, Beawar in Ajmer, Rajasthan and has rapidly expanded its operations to reach the present production capacity of 23.6 million TPA. The principal promoter of the company is Bangur Group, which is a respected business house of India.

Shree Cement Limited (SCL) has obtained Environmental Clearance for Integrated Cement Plant - Clinker (2 x 1.5 Million TPA), Cement (2 x 2.6 Million TPA), Captive Power Plant (50 MW) & WHRB (15 MW) near Village: Khapradih in District: Balodabazar - Bhatapara (Chhattisgarh) from MoEF&CC, New Delhi on 07th March, 2011; as amended on 01st June, 2011 & 04th February, 2015.

Shree Raipur Cement Plant (a unit of Shree Cement Ltd.) is now proposing an Expansion in Integrated Cement Plant - Clinker (2 x 1.5 to 2 x 2.6 Million TPA), Cement (2 x 2.6 to 2 x 3.0 Million TPA), Waste Heat Recovery Power Generation (15 to 30 MW), Captive Power Plant (25 MW) along with Synthetic Gypsum Unit (65 TPH) and DG Sets {2000 KVA(size 1000/500/250/125)} near Village: Khapradih, Tehsil: Simga, District: Balodabazar- Bhatapara (Chhattisgarh).

As per EIA Notification dated 14th Sept., 2006, as amended from time to time; the project falls under Category "A", Project or Activity '3 (b)'.

The project has been considered in front of Expert Appraisal Committee (EAC) (Industry- 1) for its First Technical Presentation (for ToR approval) on 27th March, 2015.

ToR Letter was issued by MoEF&CC, New Delhi vide letter no. J - 11011/235/2008-IA-II (I) dated 26th May, 2015.

1.2 Brief Description of the Project

Brief description about the Project is given in Table - 1.

Table - 1

S. NO.	PARTICULARS	DETAILS
A.	Nature and Size of the Project	Proposed Expansion of Integrated Cement Plant - Clinker (2 x 1.5 to 2 x 2.6 Million TPA), Cement (2 x 2.6 to 2 x 3.0 Million TPA), Waste Heat Recovery Power Plant (15 to 30 MW), Captive Thermal Power Plant (25 MW) along with Synthetic Gypsum Unit (65 TPH) and DG Sets {2000 KVA (size 1000/500/250/125)}
B.	Location Details	
1.	Village	Khapradih
2.	Taluka	Simga
3.	District	Balodabazar - Bhatapara

S. NO.	PARTICULARS	DETAILS
4.	State	Chhattisgarh
5.	Latitude	21° 35' 41.84" N to 21° 36' 29.06" N
6.	Longitude	82° 02' 14.24" E to 82° 03' 06.17" E
7.	Toposheet No.	64 G/14 & 64 K/2
C.	Area Details	
1.	Plant area	∞ Total Plant area is 159.256 ha (including Cement Plant, CPP & Colony); and proposed expansion will be done within the existing plant premises.
2.	Greenbelt / Plantation area	52.55 ha (i.e. 33% of the total plant area) has been proposed to be developed under greenbelt / plantation.
D.	Environmental Setting Details (with approximate aerial distance and direction from the plant site)	
1.	Nearest Town / City	Balodabazar (~12.5 km in ENE direction)
2.	Nearest National / State Highway	NH - 200 (~30 km in WNW direction)
3.	Nearest Railway station	Bhatapara (~18 km in NW direction)
4.	Nearest Airport	Raipur Airport (~55 km in SSW direction)
5.	National Parks, Wild Life Sanctuaries, Biosphere Reserves, Tiger / Elephant Reserves, Wildlife Corridors, etc. within 10 km radius	No National Park, Wildlife Sanctuary, Biosphere Reserve, Tiger / Elephant Reserve, Wildlife Corridor etc. exists within 10 km radius.
6.	Reserved / Protected Forests within 10 km radius	Dhabadih Reserved Forest (~4.0 km in ENE direction)
7.	Water Bodies within 10 km radius	<ul style="list-style-type: none"> ❖ Mahanadi Canal (~0.5 km in E direction) ❖ Banjari Nala (~3.0 km in NW direction) ❖ Kukardih Dam (~6.5 km in NE direction) ❖ Tengna Nala (~9.0 km in ESE direction) ❖ Chitawar Nala (~3.0 km in SE direction) ❖ Khorsi Nala (~6.5 km in SE direction) ❖ Jhorki Nala (~6.5 km in SSE direction) ❖ Ameri Diversion Canal (~4.8 km in W direction)
8.	Seismic Zone	Zone-II [as per IS 1893 (Part-I): 2002]
9.	Critically Polluted Area as per CEPI - CPCB	No critically polluted area declared under CEPI as per MoEF Circular dated 15.03.2010 exist within 15 km radius study area
E.	Cost Details	
1.	Total Cost of the Project	Total cost of project is Rs. 1965.34 Crores. <ul style="list-style-type: none"> ▪ Existing cost of Phase I:Rs. 940.10 Crores ▪ Cost of expansion of Phase I: Rs. 325.20 Crores ▪ Cost of Phase II: Rs. 600.04 Crores. ▪ Cost of CPP and miscellaneous is Rs. 100 Crores
2.	Cost for Environmental Protection Measures	<ul style="list-style-type: none"> ❖ Capital Cost - Rs. 98 Crores ❖ Recurring Cost - Rs. 2 Crores / annum

Source: Pre-feasibility Report

1.3 Location Map

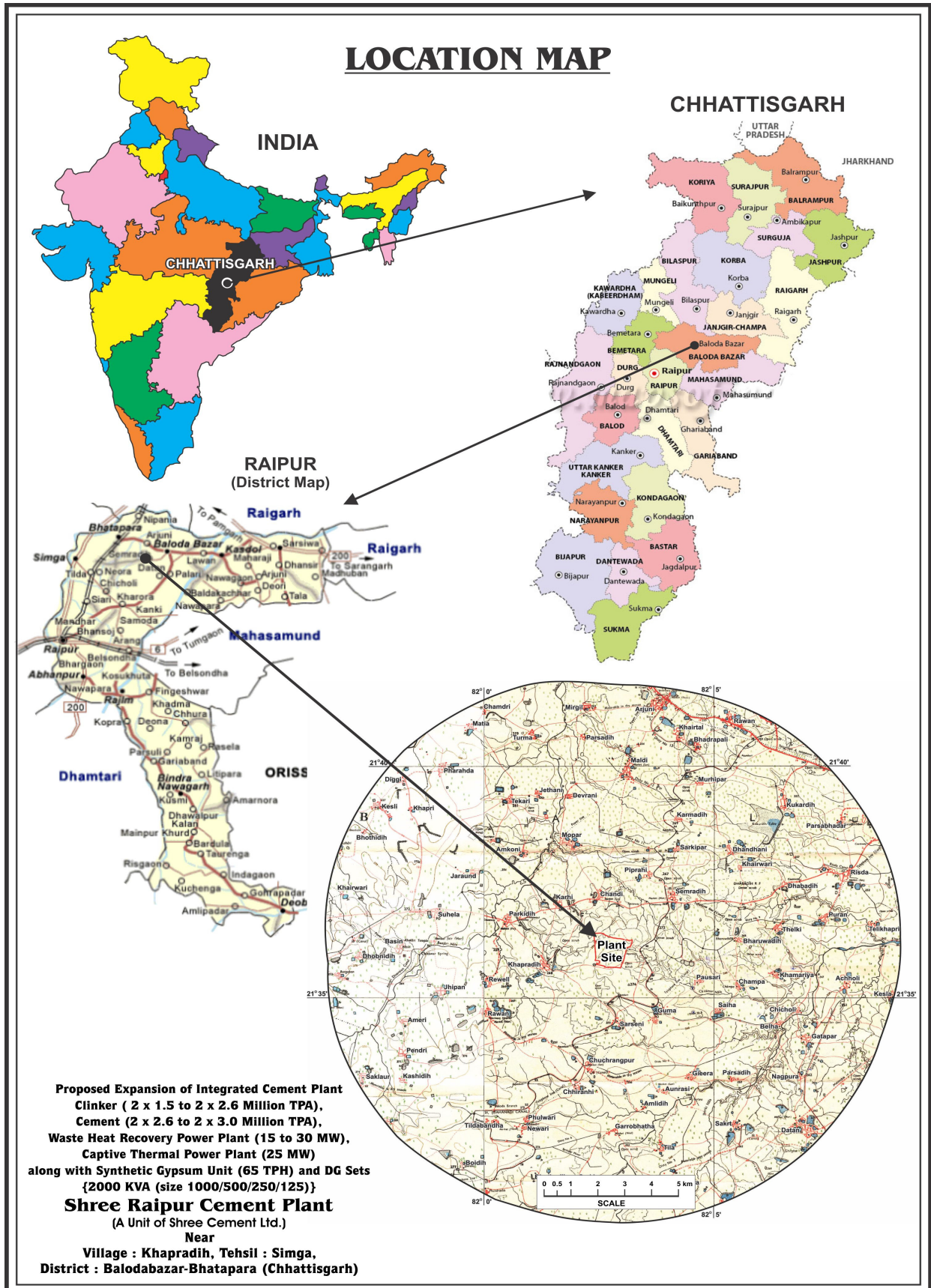


Figure 1: Location Map

1.4 Major Requirements for Proposed Expansion Project

1.4.1 Raw Material Requirement

Details regarding quantity of raw materials required, their source along with distance & mode of transportation for proposed expansion project are given in Table - 2 & 3.

Table - 2
Raw Material Requirement, Source and Transportation for Clinkerization and CPP

S. No.	Name of Raw Material	Required Quantity (MTPA)			Source	Distance & Mode of Transportation
		Existing	Proposed expansion	Total after proposed expansion		
1.	Limestone	4.8	3.52	8.32	Captive limestone mine	Covered Conveyor belt
2.	Iron ore / Red Mud	0.135	0.099	0.234	Shri Bajrang Power & Ispat Ltd. Tilda / Bharat Aluminium Company Ltd. (Balco-Korba)	Tilda - 47, Korba - 151 Road / Railway
3.	Indian, Imported, synthetic and chemical Gypsum	0.364	0.056	0.420	Swiss Singapore Overseas Pvt. Ltd Oman Vizag; Coromondal Inter National Ltd. Visakhapatnam Vizag; Synthetic gypsum plant	Vizag - 573 Road / Railway
4.	Fly Ash	1.56 - 1.82	0.24 - 0.28	1.80 - 2.10	GMR Chhattisgarh Energy Ltd Tilda, Sarda Energy & Minerals Ltd Siltara, NSPCL Limited Bhilai, NTPC Limited Sipat, KSK Mahanadi Power Co. Ltd Akaltara, Chhattisgarh Power Gen. Co. Ltd (CSEB) Marwa, D B Power Limited Raigarh.	Tilda - 47, Siltara - 72, Bhilai - 121, Sipat - 106, Akaltara - 119, Marwa - 120, Raigarh - 154 Road
5.	Slag	2.08 - 2.6	0.32 - 0.40	2.4 - 3.0	Metalman Siltara, Jayaswal Neco Industries Ltd Siltara, Jindal Steel & Power Ltd Raigarh	Siltara - 172, Raigarh - 154 Road / Railway

Source: Pre-feasibility Report

Table - 3
Raw Material Requirement, Source and Transportation for Synthetic Gypsum Unit

S. No.	Name of Raw Material	Quantity (MTPA)	Source	Distance & Mode of Transportation
1.	H ₂ SO ₄ 98%	0.22	Local Market	By road
2.	Limestone	0.33	Captive limestone mine	Covered Conveyor Belt

Source: Pre-feasibility Report

1.4.2 Fuel Requirement

Details regarding quantity of fuel required, their source along with distance & mode of transportation for proposed expansion project are given in Table - 4.

Table - 4
Fuel Requirement

S. No.	Name of Fuel		Quantity (MTPA)			Source	Distance & Mode of Transportation	Calorific value (Kcal./kg)	% Ash	% Sulphur
			Existing	Proposed expansion	Total after proposed expansion					
1.	Indian and Imported Coal / Pet Coke	Cement Plant	0.45 / 0.3	0.33 / 0.22	0.78 / 0.52	Coal: Local market/ Nearby Korba coal Bilaspur / Raigarh / USA etc. Petcoke: Local petroleum refinery / Jamnagar pet coke/ USA/SA/ Indonesia etc.	Mumbai - 1244, Raigarh - 154, Bilaspur - 57, Jamnagar / Kandla - 1560, Jamnagar / Kandla - 1560	3890/ 7936	41.7/ 0.8	0.5/ 5.5
		CPP	0.30 / 0.21	(-) 0.15 / 0.103	0.15 / 0.103					

Source: Pre-feasibility Report

1.4.3 Other Basic Requirement

Other basic requirements for the proposed expansion project are given in Table - 5.

Table - 5
Basic Requirements for the Project

S. No.	Particular	Requirement	Source
1.	Water (m ³ /day)	3000	Ground water
2.	Power (MW)	62	Captive Thermal Power Plant, Waste Heat Recovery Power Plant and DG Sets (for backup).
3.	Manpower	410	Unskilled/ semi-skilled manpower from local area & skilled from outside/local.

Source: Pre-feasibility Report

1.5 Manufacturing Process

1.5.1 Cement Plant

Cement Plant is based on Dry Process Technology for Cement manufacturing with Pre - Heater and Pre- Calciner Technology. The type of cement manufactured will be OPC, PPC & PSC.

The cement manufacturing process largely comprises of the following steps:

- ⊗ Transportation of crushed limestone from the mine site.
- ⊗ Pre-blending of crushed limestone.
- ⊗ Drying – cum-grinding of raw materials.
- ⊗ Homogenization of raw meal in a blending silo.
- ⊗ Clinkerisation of the raw meal in a rotary kiln with pre-heater and pre-calcinator
- ⊗ Grinding, storage and packing.

1.5.2 Captive Power Generation Process (Air-Cooled)

The generating unit consists of Circulating Fluidized Bed Combustion (CFBC) boiler firing multi-fuel as primary fuel, condensing steam turbine and generator, air cooled condenser and other necessary auxiliary equipment including balance of plant equipment

Various sections of the power plant are as follows:

- ☞ Fuel Storage and Handling
- ☞ Boiler and other Auxiliary equipment
- ☞ Water Treatment Plant
- ☞ Turbine and Control Room
- ☞ Condenser / De-aerator Tank
- ☞ Fly ash disposal.

1.5.3 Synthetic Gypsum Plant

The manufacturing process of Synthetic Gypsum is basically conversion of Limestone Powder by chemical reaction between Limestone and dilute Sulphuric Acid in definite proportion.

1.5.4 Waste Heat Recovery Power Plant (30 MW)

For re-utilization of the wasted heat from the expelled gases of Pre-Heaters (PH) and Air Quenched Coolers (AQC) in each Unit, SCL has proposed to expand the capacity of Waste Heat Recovery Boiler from 15 to 30 MW capacity.

Steam generated from each unit will be combined and fed to steam turbine for electricity generation.

2.0 DESCRIPTION OF ENVIRONMENT

2.1 Presentation of Results (Air, Noise, Water & Soil)

Baseline study of the study area (Composite for plant & mine) was conducted during Summer Season (March to May, 2015). Ambient air quality monitoring has been carried out at 12 stations in the study area on 24 hourly basis. The concentration of PM_{2.5} ranges between 25.2 to 41.1 µg/m³, PM₁₀ ranges between 54.0 to 80.1 µg/m³, SO₂ ranges between 5.3 to 10.3 µg/m³ and NO₂ ranges between 14.3 to 28.1 µg/m³.

Ambient noise levels were measured at 12 locations around the plant and mine site. Noise levels varies from 49.5 to 66.1 Leq dB(A) during day time and from 39.6 to 59.1 Leq dB(A) during night time.

The ground water analysis for all the 8 sampling stations shows that pH varies from 7.20 to 7.52, Total hardness varies from 150.83 to 370.22 mg/l, Total dissolved solids vary from 265 to 468 mg/l.

Soil monitoring was carried out at 8 locations and the analysis results show that soil is neutral to moderately alkaline in nature, pH value ranging from 7.46 to 7.90, with organic matter from 0.67% to 0.96 %. Soil texture is silty loam. Total nitrogen ranges from 208.78 kg/ha to 276.84 kg/ha, indicates that nitrogen is in sufficient amount in this soil.

2.2 Biological Environment

Flora: Most common species found in the area are *Azadirachta indica* (Neem), *Syzygium cumini* (Jamun), *Cassia fistula* (Amaltass), *Dalbergia latifolia* (Sisham), *Mangifera indica* (Mango), *Annona squamosa* (Sitaphal), *Phyllanthus emblica* (Amla), *Aegle marmelos* (Bel), *Psidium guajava* (Guava), etc.

Fauna: Commonly found species in the study area are *Lepus nigricollis* (Black-napped Hare), *Macaca radiata* (Bonnet Monkey), *Herpestes edwardsii* (Mongoose), *Bubulcus ibis* (Cattle Egret), *Calotes rouxii* (Roux Forest lizard), *Hoplobatrachus tigerinus* (Indian Bull Frog), *Labeo rohita* (Rohu) etc.

2.3 Socio-Economic Environment

The population as per 2011 Census records is 161142 (for 10 km radius buffer zone). As per Survey data, it is observed that total no. of household are 4156, 11157 and 17332 respectively in primary, secondary and outer zone. Sex ratio is 1010, 985 and 991 (females per 1000 males) observed in primary, secondary and outer zone respectively. SC population distribution is 3937, 13160 and 17344 respectively in primary, secondary and outer zone. ST population distribution is 3578, 8403 and 6736 respectively in primary, secondary and outer zone respectively. Literacy rate is 69%, 71.2% and 69.3% in primary, secondary and outer zone respectively. Average household size is 4.9.

3.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Anticipated environmental impacts due to the proposed expansion project along with mitigation measures are given in Table - 6:

Table - 6

Anticipated Environmental Impacts and Mitigation Measures

Discipline	Anticipated Impact	Mitigation Measures
Construction Phase		
Air	Increase in dust and NO _x concentration due to Leveling activity and Heavy vehicular movement.	<ul style="list-style-type: none"> * Sprinkling of water in the construction area and on unpaved roads. * Proper maintenance of vehicles will be done. Use of vehicles meeting PUC norms.
Noise	Increase in noise level due to Construction Equipment.	<ul style="list-style-type: none"> * Equipment will be kept in good condition to keep the noise level within 90 dB(A). * Workers will be provided necessary protective equipment e.g. ear plugs, earmuffs.
Water	Increase in suspended solids due to soil run-off during heavy precipitation due to loose soil at construction site	<ul style="list-style-type: none"> * Adequate drainage system for runoff water during construction phase.
Operation Phase		
Air	Increase in concentration of Particulate Matter Emissions	<ul style="list-style-type: none"> * Better maintenance and installation of pollution control equipment like Bag Filters / Bag House / ESP etc. * Covered storage facilities for raw material & finished product.

Discipline	Anticipated Impact	Mitigation Measures
		<ul style="list-style-type: none"> * All the roads inside the plant premises will be concreted. * Water sprinkling to reduce the PM emission level. * CPCB & CREP guidelines will be followed.
Noise	Increase in noise level within the plant area	<ul style="list-style-type: none"> * Equipment to be installed is designed to conform to occupational noise levels prescribed by regulatory agencies. * Earmuffs/ Earplugs will be provided to persons working in high noise zone. * Properly insulated enclosures will be provided to equipment making excessive noise. * Greenbelt development/ plantation will help in attenuating noise.
Water	Generation of waste water	<ul style="list-style-type: none"> * Domestic waste water generated from the plant office will be treated in STP and treated water will be utilized in Greenbelt development/ Plantation. * RO and softener reject water will be used for dust suppression, synthetic gypsum manufacturing and mill spray. * No effluent will be discharged outside the plant premises.
Soil	Degradation of soil quality due to settling of air borne dust	<ul style="list-style-type: none"> * Use of efficient pollution control systems * Maintained proper stack height. * Soil samples will be collected periodically and soil quality will be tested.
Biological Environment	Positive as greenbelt of appropriate width has been developed and maintained by SCL in the area	-
Socio-economic Environment	Overall development of the area in respect of the infrastructure development, educational growth, health facilities etc.	-

4.0 ENVIRONMENTAL MONITORING PROGRAMME

Details of the environmental monitoring schedule / frequency, which will be undertaken for various environmental components, as per conditions of EC / CTE / CTO are given in Table - 7.

Table - 7
Post Project Monitoring

S. No.	Description	Location
1.	Ambient Air Quality	Plant Site & as per EC / CTO conditions
2.	Stack emissions	Plant Site
3.	Meteorological data	Plant Site
4.	Noise Level Monitoring	Plant Boundary & as per EC / CTO conditions
5.	Water Level & Quality	Nearby Surface and Ground water sources
6.	Health Check-up	Dispensary

5.0 ADDITIONAL STUDIES

The Additional studies conducted as per the ToRs prescribed by MoEF&CC, New Delhi, vide letter no. J - 11011/235/2008 - IA II (I) dated 26th May, 2015 are Hydro-geological Study and Rainwater Harvesting Plan and Risk Assessment and Disaster Management Plan.

6.0 PROJECT BENEFITS

The proposed expansion will help in combating the growing demand of cement in the market & hence will help in the economic growth of the country. M/s. Shree Cement Ltd. is actively involved in the ESC activities in the nearby villages and same will be practiced in future also. For Socio - economic development of the nearby villages, SCL has “Shree Rural Development Society”. Infrastructure development in the nearby villages, creating educational facilities, empowering women through self-help groups, gainful employment for rural, health awareness programmes are some of the activities which has been undertaken under ESC plan for the development of the society and action plan has been prepared for the up-liftment of the society.

7.0 ENVIRONMENT MANAGEMENT PLAN

The major sources of pollution in an integrated cement plant are Particulate Matter. Air pollution is the major concern to be looked upon for the project activity. No major water, noise & soil pollution is envisaged from the proposed expansion activity. Various mitigation measures have been proposed to take care of the environment in respect of air, water, noise, soil & the green green cover of the plant site:

Particulars	Details
Air Quality Management	<ul style="list-style-type: none"> ⊗ Bag filters will be provided to control dust emitted from various dust generating points in the plant & at all material transfer points. ⊗ Dry fly ash will be transported in closed tankers. ⊗ Clinker & Fly Ash will be stored in silos and Gypsum in covered sheds. ⊗ Greenbelt will be developed around/ within the premises of the plant site to arrest the fugitive emissions. ⊗ Unloading of trucks will be carried out with proper care avoiding dropping of the materials from height. ⊗ Sprinkling of water will be done along the internal roads in the plant in order to control the dust arising due to the movement of vehicles. ⊗ Proper maintenance of vehicles will be done to reduce gaseous emissions. ⊗ Regular ambient air quality & stack emission monitoring is being carried out as per CPCB / SPCB norms to ensure that ambient air quality standards are being met all the time.
Water Management	<ul style="list-style-type: none"> ⊗ No waste water will be generated from the Integrated Cement Plant. ⊗ Domestic waste water from plant & colony will be treated in the STP & treated water will be utilized for green belt development/plantation. ⊗ RO and softener reject water will used for dust suppression and synthetic gypsum manufacturing and mill spray. ⊗ Rain Water Harvesting will be practiced within the plant premises.

Particulars	Details
Noise Management	<ul style="list-style-type: none"> ⊗ Proper maintenance, oiling and greasing of machines at regular intervals will be done to reduce generation of noise. ⊗ Personal protective equipment viz. Earplugs / Earmuffs will be provided to all operators and employees working near the machinery. ⊗ Adequate silencers will be provided in all the diesel engines. ⊗ Green Belt of appropriate width will be maintained inside the plant premises and at the plant boundary. 52.55 ha (33% of the total plant area) has been proposed to be developed under green belt /plantation. ⊗ Regular monitoring of noise level will be carried out and corrective measures in concerned machinery will be adapted accordingly to the possible.
Solid & Hazardous Waste Management	<ul style="list-style-type: none"> ⊗ No solid waste will be generated in the cement manufacturing process. ⊗ Dust collected from various air pollution control equipments is being / will be totally recycled back into the process. ⊗ STP Sludge will be utilized as manure for green belt development within the plant premises. ⊗ Used oil will be generated from plant machinery / Gear boxes and D.G set as hazardous waste which will be disposed to the CPCB authorized recycler.
Greenbelt Development / Plantation	<ul style="list-style-type: none"> ⊗ Out of the total plant area (i.e. 159.256 ha), about 52.55 ha (i.e. 33% of the total project area) has been proposed to be developed under green belt / plantation in order to reduce dust & noise pollution levels & to increase aesthetic beauty of the area. ⊗ Species proposed to be planted are <i>Azadirachta indica</i> (Neem), <i>Syzygium cumini</i> (Jamun), <i>Cassia fistula</i> (Amaltass), <i>Dalbergia latifolia</i> (Sisham), <i>Mangifera indica</i> (Mango), <i>Annona squamosa</i> (Sitaphal), <i>Phyllanthus emblica</i> (Amla), <i>Aegle marmelos</i> (Bel), <i>Psidium guajava</i> (Guava), etc.

