

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR

Expansion of Cement production capacity of
Standalone Grinding Unit from 2.0 Million TPA to 5.4
Million TPA at Villages: Tharsa, Ashti and Navegaon,
Tehsil: Mauda, District: Nagpur (Maharashtra)
Proposal No. SIA/MH/IND1/420807/2023,dt. 10.03.2023

EXECUTIVE SUMMARY

Project Proponent

M/s. UltraTech Cement Limited (UTCL)
Ahura Centre, A-Wing, 1st Floor, Mahakali Caves Road,
Andheri (E), Mumbai - 400093

Environmental Consultant

J.M. EnviroNet Pvt. Ltd.
Emmar Digital Greens, Tower - B, Unit No. 1517, Golf Course Ext. Road,
Sector-61, Gurugram (Haryana) - 122 011; E-mail: jmenviron@hotmail.com
NABET Certificate No.: NABET/EIA/2023/RA 0186 (Valid till 7th Aug., 2023)

Document No. JMEPL/UTCL-NCW/1966/EIA/July,2023/Draft-1
**3 (b) Cement Plants type of activity, Category 'B' – Brown Field
Project**

Baseline Data Generation carried out during Dec 2022 – Feb 2023 by
NABL Approved Lab: JM EnviroLab Pvt. Ltd.
(Certificate No.:TC-6821)

July 2023

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EXECUTIVE SUMMARY

1.0 INTRODUCTION

1.1 Project Name and Location

M/s UltraTech Cement Limited (UTCL), Unit: Nagpur Cement Works (NCW) is operating a standalone 2.0 MTPA cement grinding unit at Villages: Tharsa, Ashti and Navegaon, Tehsil: Mauda, District: Nagpur (Maharashtra). The existing grinding unit also obtained consent for Operation (CFO) from MPCB vide letter no. 0000145959/CR/2211001314 dated 16.11.2022 valid up to 31.10.2026, Environment clearance for the same has been obtained with vide Letter No. SEAC-2011/CR-146/TC2 dated 5th September, 2014.

NCW is now proposing to augment the cement production capacity of Grinding Unit from 2.0 million TPA to 5.4 million TPA. Standard Terms of Reference (ToR) has obtained from SEIAA, Maharashtra vide F. No. SIA/MH/IND1/420807/2023 dated 13th March, 2023. Based on the ToR conditions stipulated by SEIAA, Maharashtra, EIA/EMP has been prepared and being submitted for conducting Public Hearing.

1.1.1 Products and Capacities

The existing plant capacities as approved and as operating are given in the **Table – E1** along with the proposed expansion capacities.

TABLE- E1: STATUS OF EXISTING EC & CONSENTS


Sl. No.	Project Activity	Existing Capacity as per EC dt. 05.09.2014	Installed Capacity as per CFO	Proposed Expansion	Total Capacity after proposed Expansion
1.	Cement	2.0 MTPA	2.0 MTPA	3.4 MTPA	5.4 MTPA
2.	D. G. Set	12 MW	750 kVA	-	750 kVA

1.1.2 Capital Cost of the Project, Estimated time of Completion

The capital cost along with the cost for Environmental Protection Measures for the existing and proposed project has been given in **Table-E2**.

TABLE-E2: PROJECT COST DETAILS

S. No.	Particular	Cost of the Project		
		Existing	Proposed	After Expansion
1.	Total Cost of the Project	Rs. 491.10 Cr.	275 Cr.	Rs. 766.1 Cr.
2.	Cost for Environmental Protection Measures			
	a. Capital Cost	Rs. 4.0 Cr.	17.84 Cr.	Rs. 21.84 Cr.
	b. Recurring Cost	Rs. 0.25 Cr/Annum	1.42 Cr/Annum	Rs. 1.67 Cr/Annum

	<p>Expansion of Cement production capacity of Standalone Grinding Unit from 2.0 Million TPA to 5.4 Million TPA at Villages: Tharsa, Ashti and Navegaon, Tehsil: Mauda, District: Nagpur (Maharashtra)</p>
	<p>Executive Summary</p>

1.1.3 Project Site Details

a.) Nature of Land

The total land area available with UTCL (Nagpur Cement Works) is 84.14 Ha. The proposed expansion will be done within this existing plant premises. No forest land is involved.

b.) Project Site Accessibility and Environmental settings

The project site accessibility and Environmental settings from 10 Km radius from the plant site is described below:

- Nearest Town- Nimkheda (~4.0 km in East direction)
- Nearest City- Nagpur (~30 km in WSW direction)
- Nearest State/highway- SH-253 (Adjacent to the project site in West direction), SH- 266 (~ 2.5 km in SSW direction), and NH- 44 (~ 12 Km in West Direction).
- Nearest Railway Stations are: Chacher RS (~ 1.5 km in WSW direction), Tharsa RS (~ 4.0 km in ENE direction), Salwa RS (~ 7.0 km in WSW direction), and Rewral RS (~ 9.5 km in ENE direction).
- Nearest Airport- Dr. Babasaheb Ambedkar International Airport Nagpur (~36 km in SW direction)
- Water Bodies within the 10km radius are given below:
 - Sand Nadi (~1.25 km in ESE direction)
 - Bhagi Nala (~1.5 km in North direction)
 - Pench Left Bank Canal (~2.0 km in WNW direction)
 - Gangner Nala (~3.0 km in WSW direction)
 - Ramtek Canal (~4.5 km in NE direction)
 - Chaupan Nala (~6.0 km in WNW direction)
 - Kanhan River (~7.0 km in SSW direction)
 - Sindhi Nala (~7.0 km in WNW direction)
 - Kharki Nala (~9.0 km in WSW direction)
 - Sur Nadi (~ 9.5 km in NNE Direction)
- Seismic Zone-Zone II [as per IS 1893 (Part-I): 2002]
- Other Industries within 10-km aerial radius: Thermal Power plant of NTPC, Copper and Steel Plant of Hindalco industries, and Cotton mill of Surya Lakshmi Industries

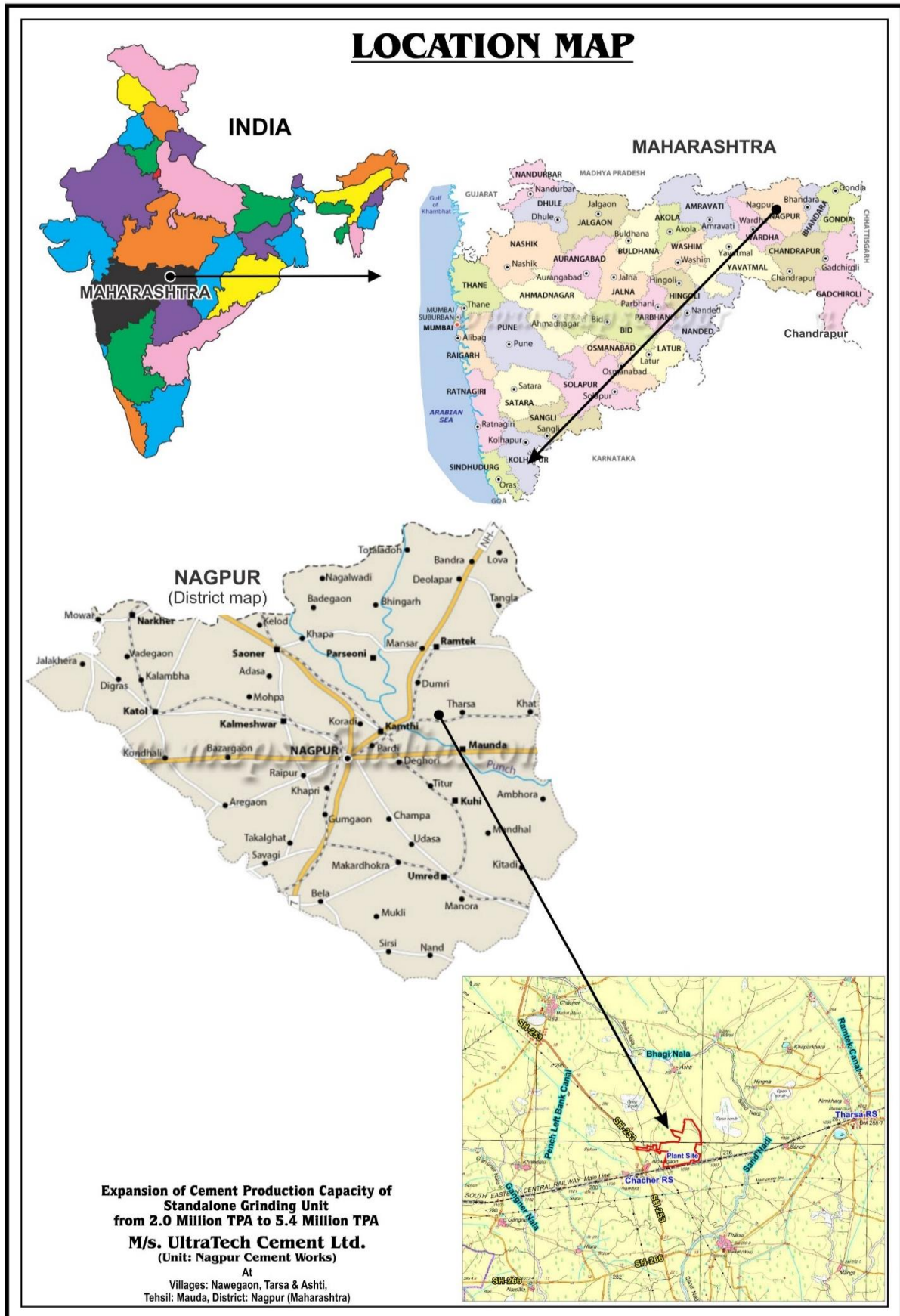


FIGURE-E1: LOCATION MAP



Expansion of Cement production capacity of Standalone Grinding Unit from 2.0 Million TPA to 5.4 Million TPA at Villages: Tharsa, Ashti and Navegaon, Tehsil: Mauda, District: Nagpur (Maharashtra)

Executive Summary

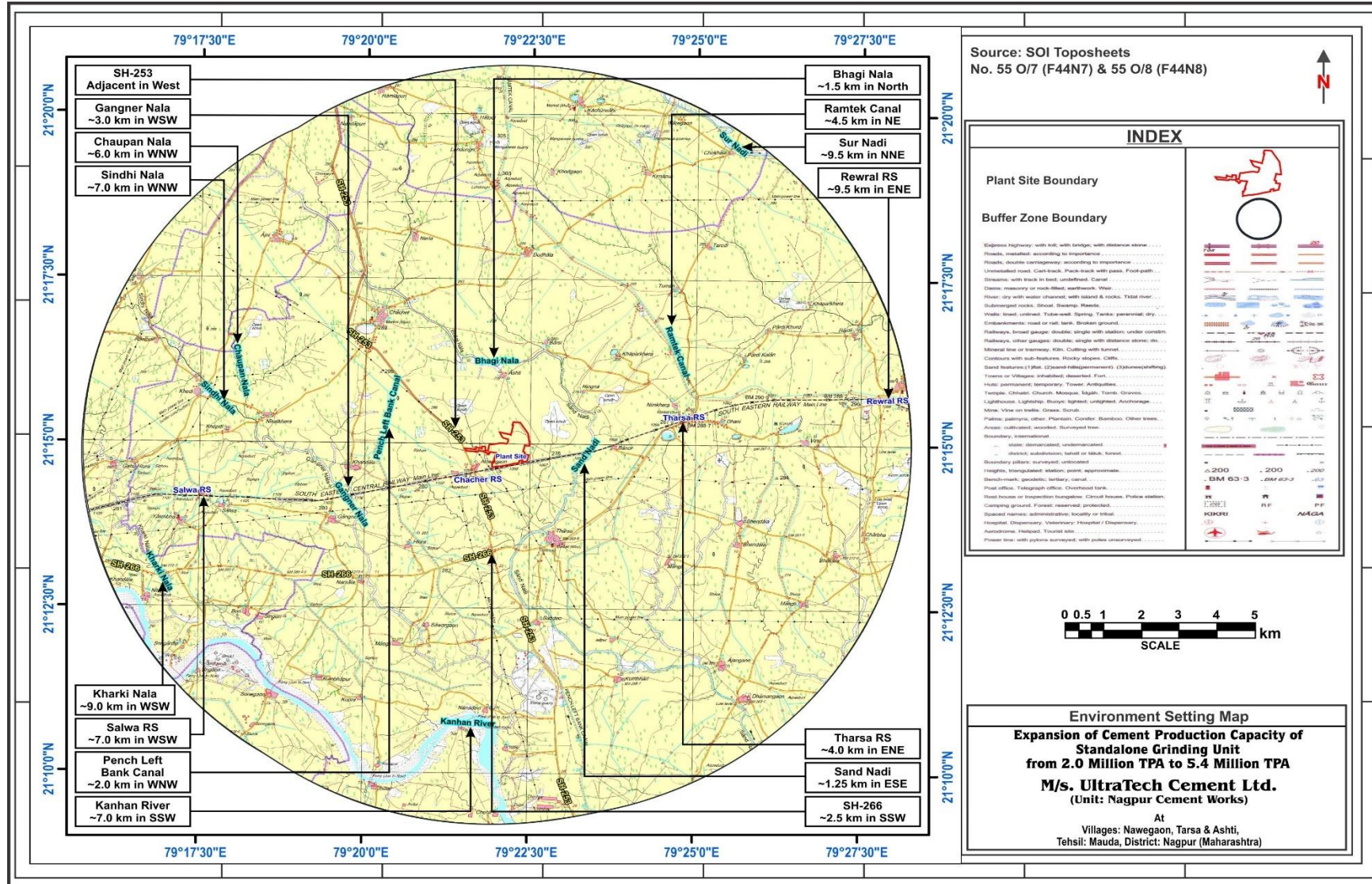


FIGURE- E2: ENVIRONMENT SETTING MAP



The site is well connected with communication facilities like telephone, fax, wireless and as such, no constraints are envisaged in this aspect as the Tehsil and District headquarters are near to the site.

2.0 PROJECT DESCRIPTION

2.1 Process Description in Brief

Major steps involved in the process of Grinding Unit are given as below:

- Clinker storage & handling
- Fly Ash storage & handling
- Gypsum storage & handling
- Slag Storage & handling
- Cement production (Grinding) and storage
- Cement packing & dispatch

Process flowchart for the grinding unit has given in **Figure E3**.

2.2 Other Project Associated Activities

2.2.1 D.G. Set:

DG Sets (750 KVA) is being/ will be operated for power back up in case of emergency.

- a. The fuel oil is heated for free flow to D.G. Set.
- b. It is transferred for settling-to-settling tank to remove unwanted material. Fuel oil is further centrifuged.
- c. After centrifuging, the fuel oil is transferred to another service tank, heated, filtered and injected into engine for combustion.
- d. The engine generates power and produces electricity.

2.3 Material Balance

Mass balance diagram for manufacturing of cement at the plant are given in **Figure E4**.

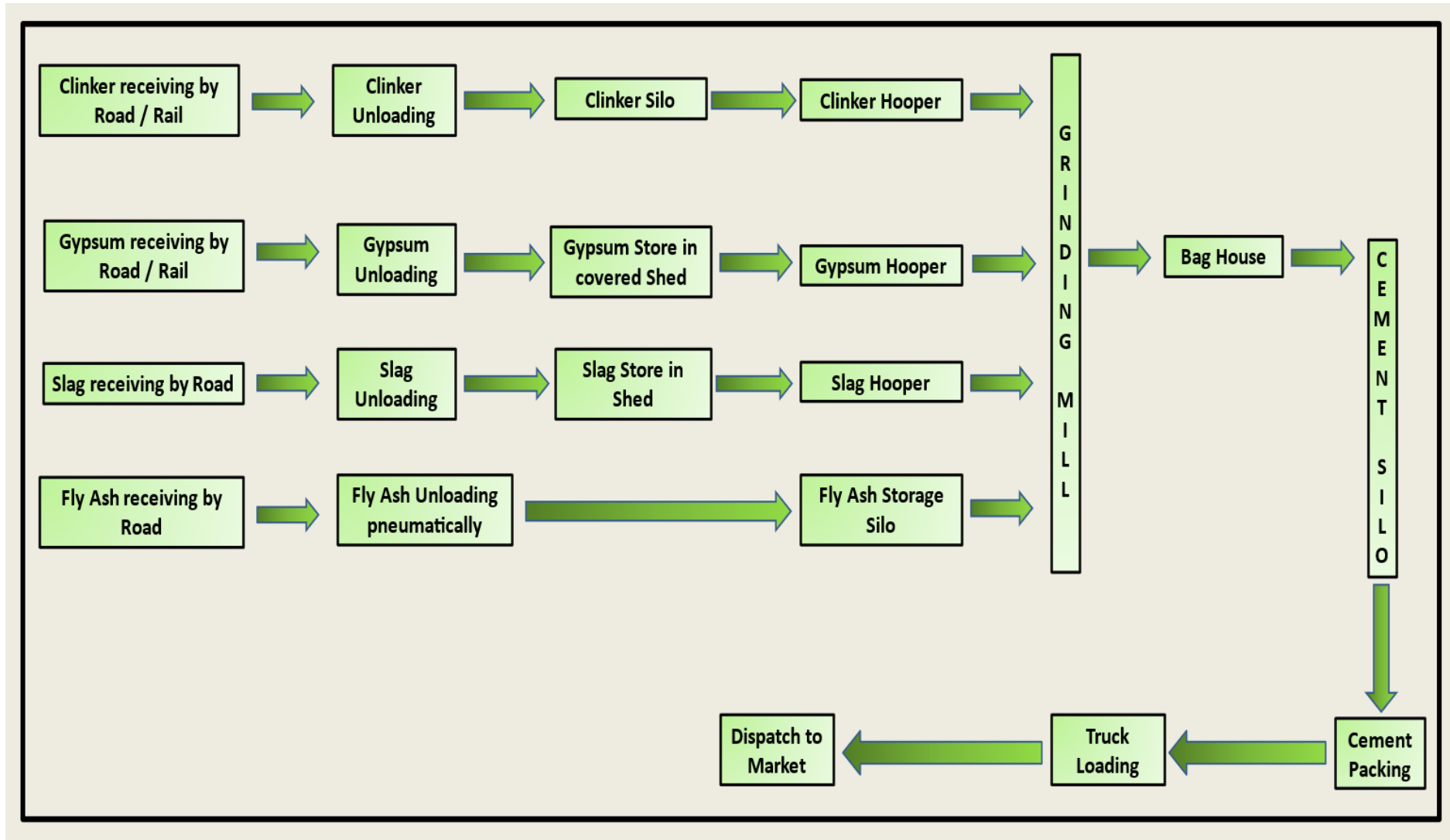
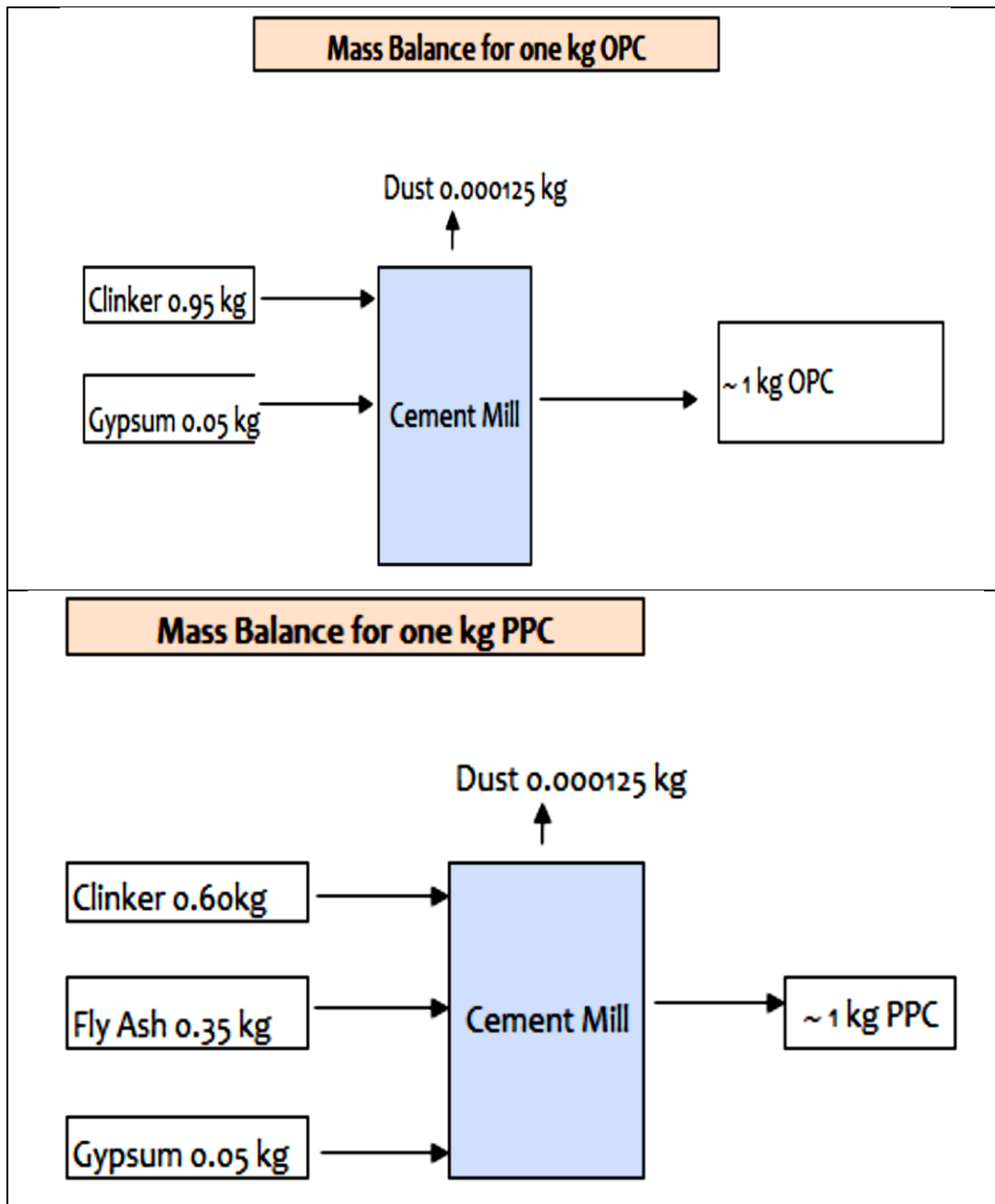


FIGURE-E3: MANUFACTURING PROCESS FLOWCHART



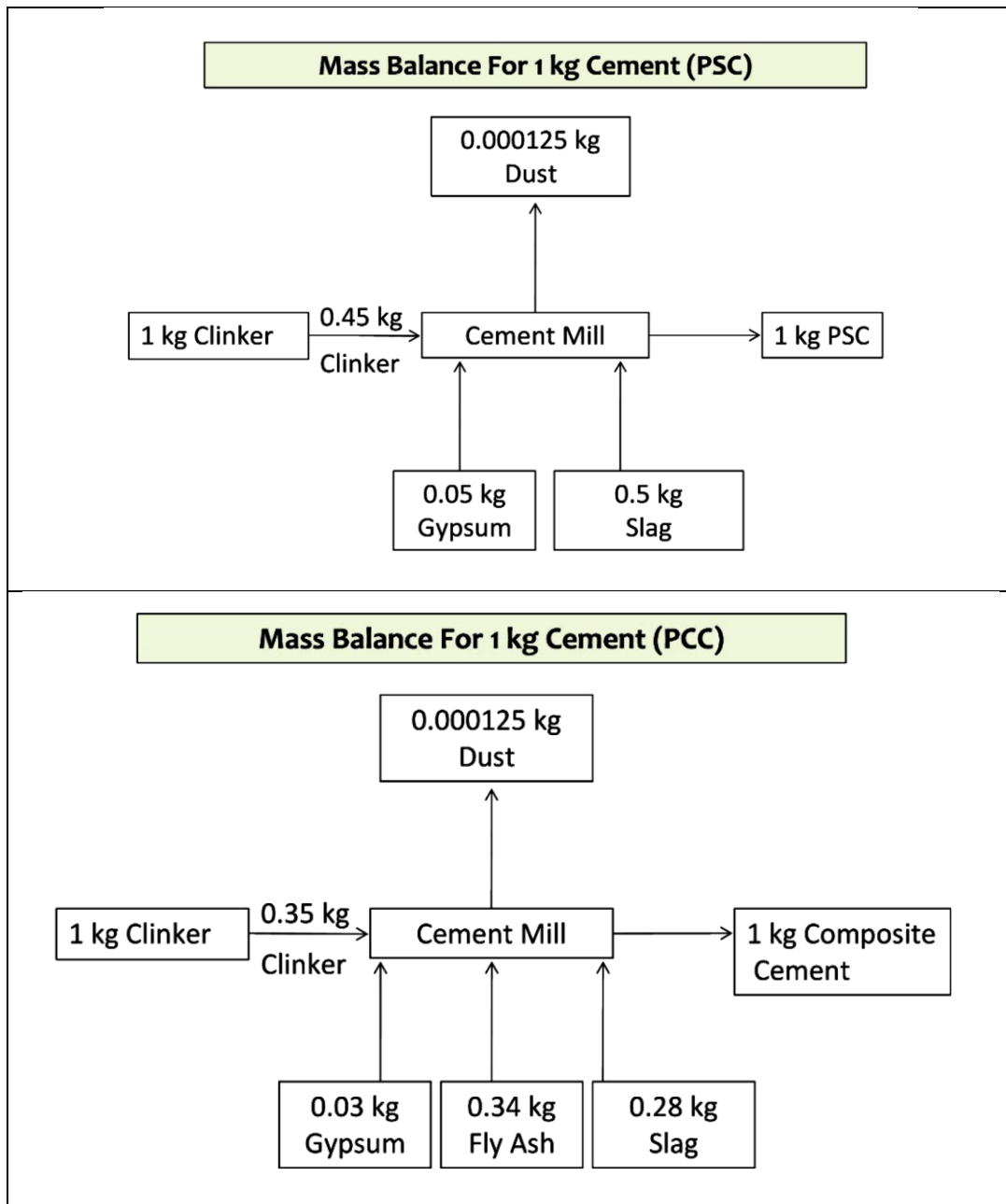


FIGURE-E4: MATERIAL BALANCE DIAGRAM

2.4 Raw Material & Fuel Requirement

Clinker is main raw material to produce gray cement by the process of grinding. Few of the additives will be added to clinker while grinding in the ball mill as substitute to clinker. In NCW, Fly Ash is being used in the existing plant whereas Slag will also be used in the proposed expansion in addition to Fly Ash. Pozzolana, when used as a replacement, are generally substituted for 10 -50 % of clinker.

Gypsum is added to clinker to increase its setting time and thus it makes the cement hardening process slow on mixing with water. In general, about 5% Gypsum will be added during the grinding process.

HFO/HSD is used in D.G. Sets to meet the emergency power requirement.

The raw material quantity, source along with distance and modes of transportation are given in below **Table-E3** and Fuel requirement is given in **Table-E4**.

TABLE-E3: RAW MATERIAL REQUIREMENT

Sl. No.	Raw Material	Existing Quantity (Million TPA)	Proposed Quantity (Million TPA)	Total After Expansion Quantity (Million TPA)	Source	Approx. Distance & Mode of Transportation
1.	Clinker	1.2	2.04	3.24	Awarpur Cement Works, Maharashtra /Rawan Cement Works – Rawan, Balodabazar (Dist.), and other UTCL Units.	~240 km Rail / Road
2.	Gypsum	0.10	0.17	0.27	Bharuch District of Gujarat, Coromandal Fertilizers, Vaizag (Vishakhapatnam)	~850 Km Rail / Road
3.	Fly ash	0.70	1.19	1.89	NTPC Power Plant at Mauda / Nearby TPP	~ 8 km Road
4.	Slag	-	0.20	0.20	Sunflag and Other sources nearby Nagpur	~ 50 km Road

TABLE-E4: FUEL REQUIREMENT

FUEL REQUIREMENT							
S. No.	Name of Fuel	Existing Quantity	Proposed Quantity	Total After Expansion Quantity	Calorific value (Kcal./kg)	Source	Distance & Mode of transportation
1.	HSD	10	-	10	8000-10,000	IOCL, Nagpur	~ 10 Km Road

2.5 Resources Requirement

Existing plant and the proposed expansion project require various resources which are described below.

2.5.1 Land Requirement

The total area acquired for this standalone grinding unit is 84.14 Ha located in the Survey nos., 203/1, 204, 220, 221/1, 221/2, 221/3, 221/4, 222/2, 223/1, 223/2, 224, 225/1, 225/2, 226,227, 228, 229, 230, 232/2, 234/2 (Village: Ashti), 197, 198, 199, 200, 202/1, 202/1A, 202/1B, 202/2,203/1, 203/2, 203/3, 205, 206, 208, 209, 210, 211, 212, 213, 214/1, 214/2, 215/1, 215/2, 215/3, 216/1, 216/2, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228/1, 228/2, 229/1, 229/2A, 229/2B, 230, 231/1, 232 (Village: Tharsa), 34, 35, 39, 32/1 (Village: Navegaon) at Mauda Tehsil, Nagpur District, Maharashtra. The entire land area is under possession of M/s UltraTech Cement Ltd.



Out of the total area of land, the proposed expansion plant will be set up in an area of 8.68 Ha of land. Around 34.70% i.e., 29.20 Ha of land will be developed under greenbelt plantation. Presently, 25.0 (29.7%) Ha of area is fully developed under greenbelt.

Plant area Break-up is given in **Table E5**.

TABLE-E5: PROJECT AREA BREAK-UP

S. No.	Particulars	Area (In Ha.)
1.	Existing Grinding Unit	5.87
2.	Proposed expansion in Grinding Unit	2.15
3.	Canteen & Guest House building	2.91
4.	Utilities, Roads and Drains	5.66
5.	Green Belt	29.2
6.	Truck parking Area	1.78
7.	Open Space	36.57
Total		84.14

2.5.2 Water Requirement

The total water requirement of the grinding unit will be 380 KLD and it will be sourced from ground water and STP (auxiliary). The details of the total water requirement is given in **Table E6**.

TABLE-E6: WATER REQUIREMENT

Particular	Existing Requirement	Proposed Requirement	Total after expansion	Source
Water (KLD)	190	190	380	Ground water & STP (auxiliary)

2.5.3 Power Requirement

Details of the power requirement for the grinding unit has given in **Table E7** below.

TABL- E7: POWER REQUIREMENT

Particular	Existing Requirement	Proposed Requirement	Total after expansion	Source
Power (MW)	8.5	13.5	22	Maharashtra State Electricity Board (MSEB) / Grid and DG Set for backup

2.5.4 Manpower Requirement

Details of manpower requirement for the grinding unit is given in **Table E8** below.

TABL- E8: MANPOWER REQUIREMENT

Particular		Existing Requirement	Proposed Requirement	Total after expansion	Source
Manpower (No. of Persons)	Regular	38	-	38	Unskilled / Semi-skilled - local area and Skilled - outside / local
	Contractual	240	60	300	

2.6 Sources of Pollution

The major sources of pollution from the existing and proposed cement grinding unit are given below:

- Source Emissions from grinding activity through 30-mts stack, and bag dust collectors with 99% efficiency- details are given in **Table E9**
- Fugitive emissions from material handling and material transfer points
- Solid waste generation- details are given in **Table E10**
- Noise from the plant operations- details given in **Table E11**

TABLE-E9: DETAILS OF APCEs INSTALLED AT PLANT

Sl. No.	Location	Type of APCE	Expected Emissions
1.	Cement mill	Bag House	PM
2.	Cement mill hopper	Bag Filter	PM
3.	Cement Silos	2 Bag Filters	PM
4.	Packing plant	4 Bag Filters	PM
5.	Transfer points	4 Bag Filters	PM
6.	Clinker Silo	Bag Filter	PM
7.	Fly Ash Silo	Bag Filter	PM
8.	Clinker Unloading point	Bag Filter	PM
9.	D.G. Set	Stack Height as per CPCB	SO ₂ & CO

TABLE-E10: DETAILS OF SOLID HAZARDOUS WASTE GENERATION& MANAGEMENT

Sl. No	Name of the Hazardous waste	Stream	Quantity		Disposal Option
			Existing	After Expansion	
1	Used /Spent Oil	5.1 of Schedule-1	1.26 KL/Annum	~10 KL/Annum	Will be disposed through sold to CPCB Authorized recycler
2	Waste Residue containing Oil	5.2 of Schedule-1	1.47 TPA	5.0 TPA	
3	Empty barrels/ Containers/liners	33.1 of Schedule-1	1 TPA	2 TPA	Sold to scrap dealers
4	Contaminated cotton rags or other cleaning materials	33.2 of Schedule-1	0.5 TPA	1 TPA	

TABLE-E11: DETAILS OF NOISE LEVELS

S. No	Location	Noise Levels (dB (A))
1	Compressor House	78-90
2	Pump House	85-89
3	Cement mill	85-90
4	Packing plant	85-90

3.0 BASELINE ENVIRONMENT STUDIES

The baseline study was conducted within a 10 Km radius from the periphery of the plant site. Baseline data for environmental attributes like ambient air, meteorology, water, hydrology, land use, soil, geology, noise, socio-economic, ecology and biodiversity etc. were collected. The study was conducted during the Winter season from **December 2022 to February 2023**. The Baseline Data Monitoring (BDM) was carried out by our associate laboratory – M/s JM EnviroLab Pvt. Ltd., Gurgaon. Further, a buffer area extending to 10 km radii from the project site has also been studied, though with a lesser degree of detail in order to understand the land use and places of environmental sensitivity of the area.

3.1 Meteorological Data

As per 30 years meteorological data of Sonegaon IMD Station from 1981-2010, the summer begins in early March and lasts until June. April and May are the hottest months. Monsoon begins in late June. October and November see the retreat of the monsoon and a return of high temperatures until late November. Atmosphere is generally dry except during the monsoon period.

The site micrometeorology is described below in **Table E12**

**TABLE: E12- MICROMETEOROLOGY AT SITE
(WINTER SEASON- DEC., 2022 TO FEB 2023)**

Month	Temperature (°C)		Relative Humidity (%)		Wind Speed (m / sec.)		Cloud Cover (okta)
	Max.	Min.	Max.	Min.	Max.	Min.	
Dec., 2022	29.3	9.3	100	23.8	4.2	0	1
Jan., 2023	31.3	6.5	100	13.4	6.8	0	2
Feb., 2023	37.1	10.7	72.12	6.5	6.5	0	0

3.2 Baseline Environmental Data (Air, Noise, Water, & Soil)

Ambient Air Quality Monitoring reveals that the concentrations of PM10 and PM 2.5 for all the 8 AAQM stations were found between 50.4 to 86.1 µg/m³ and 27.8 to 50.4 µg/m³, respectively. All the ranges of pollutants seem to be below the prescribed CPCB standards. (PM 10= 100µg/m³; PM 2.5= 60µg/m³).

As per the gaseous pollutants SO₂ and NO_x are concerned, the prescribed CPCB limit of 80 mg/m³ has never surpassed at any station. The concentrations of SO₂ and NO_x were found in range of 7.2 to 11.0 mg/m³ and 13.9 to 27.5 mg/m³ respectively. All values are well within the prescribed norms. The carbon monoxide is found to be maximum near plant site (0.74 mg/m³) due to vehicular activities and other plant activities.

Ambient noise levels were measured at 08 locations around the plant site. Noise levels varied from 50.6 to 58.7 Leq dB (A) during day time and from 41.3 to 48.1 Leq dB(A) during night time.

Surface water analysis has been done from the nearby water bodies. The pH of the surface water sample was observed from 7.85 to 7.87. The color is found to be BDL (DL 1.0) at the sampled location.

The turbidity was observed from 1 to 5 NTU. The odour was found agreeable at the sampling location. Total hardness varied from 185.2 to 277.2 mg/l, alkalinity varied from 180.5 to 256.5 mg/l, Total Dissolved Solids varied from 326.0 to 495.0 mg/l, BOD varied from 8.3 to 17.0 mg/l, COD varied from 32.0 to 64.0 mg/l. The level of DO is varied from 6.3 to 6.9 mg/l. The concentration of chloride, sulphate, magnesium, calcium, Iron and fluoride is found varied from 69.9 to 89.9 mg/l, 29.54 to 88.62 mg/l, 17.36 to 26.47 mg/l, 45.50 to 67.30 mg/l, 0.24 to 0.36 mg/l, 0.63 to 0.54 mg/l.

The ground water/drinking water samples were collected from 08 locations. The physico-chemical quality of groundwater was compared with drinking water standard (IS: 10500-2012). The pH of the water samples ranged from 7.18 to 7.65 indicating neutral to slightly alkaline in nature, and maximum pH was recorded at the village Khadala Village. The colour was BDL, and odour were agreeable at all sampling locations. The values of total hardness (193.05 to 895.90 mg/l), alkalinity (190.0 to 375.25 mg/l), calcium (45.54 to 186.10 mg/l), magnesium (18.04 to 113.10 mg/l), sulphates (49.39 to 274.50 mg/l), and total dissolved solids (456.0 to 1448.0 mg/l) in most of the samples taken are seem to be above the acceptable limits.

The Nitrate concentration (1.44 to 9.44 mg/l) and Iron concentrations (0.13 to 0.26 mg/l) are seen to be within acceptable limit. The few samples shown above the acceptable limit for the parameter Magnesium (18.0 to 113 mg/l) which can cause a laxative effect and impact in bowel movement in continuous consumption.

Thus, it can be concluded that the groundwater samples were observed to be good and complying to the drinking water standard (IS: 10500-2012).

The soil samples were Blackish brown in colour as well and clayey in texture. All soil samples are slightly to above alkaline having pH range from 7.23 to 8.28, where nutrients remain in available form in the soil. Water holding capacity (40.64 to 46.99 %) and bulk density (1.35 to 1.49 mg/kg) were ideal for the crops. Physical quality of soil samples is good for the plantation.

The organic matter (0.62 to 0.92 %) shows that the study area is very poor in adequate levels of organic matter, nitrogen (159.98 to 352.92 kg/ha) is sufficient, phosphorus (16.43 to 36.84 kg/ha) medium and potassium (129.37 to 308.79 kg/ha) with adequate amounts. This indicates that soil fertility is good with nitrogen and potassium sufficient in soil samples in the study area. Other nutrients were present in the soil samples, namely calcium (1030.05 to 2373.59 mg/kg), magnesium (229.91 to 770.37 mg/kg) and zinc (27.48 to 51.96 mg/kg).

3.3 Biological Environment

Anogiessus latifolia (Dhawda), *Azadirachta indica* (Neem), *Albizia lebbeck* (Sirish), *Albizia procera* (Sirish Panda), *Aegle marmelous* (Bel) *Acacia catechu* (Khair), *Acacia Nilotica* (Babul), etc are dominant trees in the study area. *Balanites roxburghii*, *Butea superba*, *Calycopteris floribunda*, *Combretum ovilifolium*, *Cleistanthus collinus*, *Cassia tora* etc. are common herbs in the study area. *Cynodon dactylon* (Doob), *Dendro calamus Strictus* etc. are common grass in the study area. *Funambulus palmarum* (Five palm striped Squirrel), *Mus booduga* (Little Indian Field Mouse) are common mammals that are found in study area. *Bungarus fasciatus* (Banded Krait), *Hemidactylus flaviviridis*

(Indian wall lizard) etc. are common reptiles that are found in study area. Indian pond frog, Indian bull Frog etc. are common Amphibians that are found in study area.

3.4 **Socio-Economic Environment**

An essential part of environmental study is socio-economic environment incorporating various facts related to socio-economic conditions in the area, which deals with the total environment. Socio economic study includes demographic structure of the area, provision of basic amenities viz., housing, education, health and medical services, occupation, water supply, sanitation, communication, transportation, prevailing diseases pattern as well as feature of aesthetic significance such as temples, etc. at the baseline level. This helps in visualizing and predicting the possible impact depending upon the nature and magnitude of the project.

It can undoubtedly be said that this proposed expansion in grinding unit will provide direct and indirect employment and improve the infrastructural facilities and standards of living of the area. In the nearby areas, gross economic production will increase substantially due to the proposed the grinding unit in the area.

3.5 **Land Use& Land Cover**

The details of LULC study in the 10 Km radius of the plant site has given in **Table E13**.

TABLE-E13: LULC STATUS OF THE STUDY AREA

Class Name	Area (Ha)	Area (%)
Agriculture Area	30295.64	83.72
Vegetation/Plantation	2329.55	6.44
Surface Water Bodies	830.35	2.29
Open Scrub Land/Waste Land	795.42	2.20
Industry	694.04	1.92
Human Settlement	682.10	1.88
Road	529.31	1.43
Railway	27.83	0.08
Mine Area	12.79	0.04
Total	36187.03	100

3.6 **Traffic Study**

Due to the expansion project, there will be addition of Heavy and Light motor vehicles in the existing traffic. The LOS value is “**B-Very Good**” for **SH-253**. Thus, it can be concluded that the present road network is good enough to bear the increased traffic load. However, internal and nearby roads will be maintained as and when needed to facilitate transportation.

4.0 **ANTICIPATED IMPACTS & MANAGEMENT PLAN**

The anticipated impacts and management plan for the proposed expansion project is given in **Table E14**.

TABLE- E14: ANTICIPATED IMPACTS AND MANAGEMENT PLAN

Sl. No	Attributes	Impact	Mitigation	Management Plan
Construction Phase				
1	Air	<ul style="list-style-type: none"> Increase in Particulate Matter (dust) and NO_x concentration due to leveling, grading, earthwork and foundation works and Heavy vehicular movement. 	<ul style="list-style-type: none"> Measures to suppress the particulate matter during site preparation. Measures to reduce SO₂, NO_x due to vehicular movement. 	<ul style="list-style-type: none"> Construction equipment & vehicles having valid PUC certificate will be deployed during the activity to restrict exhaust emission. Proper upkeep and maintenance of vehicles. All vehicles will be maintained in well condition by regular preventive maintenance to reduce the exhaust level. Speed of vehicles within the plant premises will be limited to 20 km/hr. Treated sewage water from STP will be used for dust suppression. Around 34.70% i.e., 29.20 Ha of land will be developed under greenbelt plantation. Presently, 25.0 (29.7%) Ha of area is fully developed under greenbelt.
2	Water	Domestic wastewater will be generated from site.	Proper treatment of waste water generated and reutilization of the same.	Domestic waste water (09 KLD) generated from office toilets, canteen and guest house will be treated in STP (20 KLD Capacity) and treated water from STP will be used for greenbelt development / plantation. No water/effluent will be discharged outside the plant boundary.
3	Soil	<ul style="list-style-type: none"> Topsoil removal Soil Compaction - Compaction is a common problem during the construction activity due to the movement of large number of heavy machineries over the soil. Soil Contamination - Due to the accumulation of cement, used for construction purpose, on the top soil results in the lack of oxygen and hence, reducing the soil porosity. Soil Degradation - Soil stockpiling during the construction phase will increase the risk of mixing of top 	<ul style="list-style-type: none"> Reutilization of topsoil and prevention of runoff of the same. Measures to minimize wastage of materials. Segregation and recycling of wastes generated. 	<p>Topsoil for the site preparatory activities will be kept with surrounding barricade and will be reutilized for landfilling. Other waste generated from the construction activity will be utilized in leveling of land. To reduce the soil compaction, working on the wet soil will be avoided. Mention quantity, disposal methods like authorized recyclers for waste oil and buyback arrangement for used batteries etc.</p>

		soil with the sub-soil components & other construction material, thereby reducing its quality.		
4	Noise	<ul style="list-style-type: none"> • Movement /operation of transport and construction vehicles / equipment. • Transportation of equipment, materials and people. • Other important activities involved in construction stage such as excavation, earthmoving, compaction, concrete mixing, crane operation, steel erection, mechanical /electrical installation. • Piling work during laying down of foundation for infrastructure. 	<ul style="list-style-type: none"> • Measures to reduce noise level of vehicles and machineries. • Keeping the noise levels as prescribed by CPCB- 90 dB (A). 	<ul style="list-style-type: none"> • Speed of vehicles within the plant premises will be limited to 20 km/hr. • Construction activities & HEMM operations will be during the daytime only. • Equipment will be kept in good condition to keep the noise level within the prescribed norms. • Barricading the construction site.
5	Biological Environment	<ul style="list-style-type: none"> • Particulate matter emission may cause migration of wild animals and birds. • Fugitive emissions (dust) may impact the terrestrial flora. • Increased noise level due to running of machinery may scare the wild fauna and force them to migrate to other areas. 	<ul style="list-style-type: none"> • Awareness programmes for employees to protect the nature. • Proper maintenance of machineries by oiling and greasing at regular intervals 	<ul style="list-style-type: none"> • Training/education will be provided to employees for giving awareness of the importance to conserve nature. • Use of water sprinklers on roads to avoid particulate matter. • Transport vehicles and machinery will be properly maintained and periodically checked for pollution level to reduce noise and gaseous emission in the surrounding environment.
6	Occupational Health & Safety	<ul style="list-style-type: none"> • Exposure to dust, • Noise exposure, & • Physical hazards 	<ul style="list-style-type: none"> • Distribution of PPEs should be done. • Annual Health Surveillance Assessment. 	<ul style="list-style-type: none"> • Ear plugs, ear muffs & all necessary protective equipment will be provided to workers. • Well-equipped Occupational Health Centre with adequate paramedical staff. • Routine and special investigation related to occupational health is being/will be done. • Health surveillance and maintenance of health record is being/will be done. • Rules and procedure for effective implementation of Safety Health and Environment policy and made to know all

				employees is being/will be done.
Operation Phase				
1	Air	Dispersion of particulate matter from the material transfer points & packing plant	<ul style="list-style-type: none"> • Use of efficient APCEs to control the fugitive dust emissions. • Maintaining proper stack height. 	<ul style="list-style-type: none"> • Air pollution control equipment such as bag filters is being/will be installed. • Bag filters will be provided before venting out the gases. The bag filters used will be 99.9 % efficiency. • Dust extraction arrangement for packing machines will be provided and dust collected in Bag filters will be recycled back to the process.
2	Water	Domestic waste water will be generated	Proper treatment of waste water generated and reutilization of the same.	Domestic waste water generated from office toilets, canteen and guest house will be treated in STP and treated water from STP is being/will be used for greenbelt development / plantation. No water is being/will be discharged outside the plant boundary and No effluent is generated in the process.
3	Soil	Soil degradation due to deposition of particulate matter & cement	Efficient APCEs will be provided, stacks provided, and Greenbelt development	<ul style="list-style-type: none"> • Waste will be collected and segregated. The waste is being/will be sold to authorized vendor from CPCB/MPCB as per scientifically in compliance of Solid Waste Management rules 2016, as amended thereof.
4	Noise	Noise generated from the operation of machineries	<ul style="list-style-type: none"> • Greenbelt development, • Distribution of PPEs. • Proper greasing & oiling of machineries at regular intervals. 	<ul style="list-style-type: none"> • Properly insulated enclosures are being/will be provided to equipment making excessive noise. • Proper maintenance, oiling and greasing of machines at regular intervals is being/will be done to reduce generation of noise.
5	Biological Environment	<ul style="list-style-type: none"> • Particulate matter emissions from stack and fugitive emissions due to transportation activity & material handling may degrade the soil quality of surrounding environment that may affect the biodiversity of surrounding environment. • Particulate matter emission may cause migration of wild animals and birds. • Fugitive emissions (dust) may impact 	<ul style="list-style-type: none"> • Greenbelt development. • Use of efficient APCEs. • Proper maintenance of machineries by oiling and greasing at regular intervals. 	<ul style="list-style-type: none"> • Training/education is being/will be provided to employees regarding the importance to conserve nature. • Bag dust collectors with 99.9% efficiency is being/will be installed to control particulate matter emissions from the operations. • Use of water sprinklers on roads to avoid particulate matter. • Periodical maintenance work such as oiling and greasing is being/will be done for machineries.

		<p>the terrestrial flora. The settlement of dust on the laminar surface of plants can impede the efficiency of photo-transduction and thereby, affect the productivity of plants. In some of the plant, it may also smother the leaf surface blocking stomata, resulting in reduced transpiration.</p> <ul style="list-style-type: none"> Increased noise level due to running of machinery may scare the wild fauna and force them to migrate to other areas. 		
6	Occupational Health & Safety	<ul style="list-style-type: none"> Exposure to dust, Noise exposure, Physical hazards 	<ul style="list-style-type: none"> Distribution of PPEs & Periodical Health Surveillance Assessment should be done. 	<ul style="list-style-type: none"> Proper maintenance of machineries Installation of compressors in closed buildings. Annual Health Surveillance Study is being/will be carried out. Adequate dust control systems will be implanted and good housekeeping is being/will be practiced.

5.0 ALTERNATIVE ANALYSIS

5.1 Alternative Site

M/s UltraTech Cement Limited (Unit: Nagpur Cement Works) is proposed to expand the cement production capacity of Standalone Grinding Unit from 2.0 Million TPA to 5.4 Million TPA within the existing plant premises which is already under possession of the company.

Hence, no alternative sites have been analyzed for the proposed expansion project.

5.2 Alternative Technology

The existing grinding unit is using the technology- Ball mill with Roller Press. The whole technology is Dry process, energy efficient and keeps the emission under 30 mg/Nm³. This technology is one of the best and proven for standalone grinding unit; hence no alternative technology has been considered.

6.0 ENVIRONMENTAL MONITORING PROGRAM

6.1 Ambient Air, Noise, Water and Soil Quality

A monitoring schedule is very important in order to ensure that the wastewater and emissions conform to the standard for which control measures have been designed. As it is required that installation and operation of water pollution control facilities should limit concentration and quantum of pollutants released to the environment properly, regular continuous monitoring of flow and pollutants should be done. A comprehensive monitoring program for construction phase and operation phase is suggested in **Table E15**.

TABLE-E15: POST-PROJECT ENVIRONMENT MONITORING MATRIX

S. No	Attributes / Aspects	Monitoring Parameter	Location	Frequency	Responsibility
Construction Phase					
1.	Ambient Air quality Monitoring	PM ₁₀ , PM _{2.5} , SO ₂ , NO _x as per NAAQS, 2009	08 locations on within 10-km radius around Grinding Unit	Twice a Week	Environment engineer
2.	Water Quality	pH, Turbidity, Colour, Odour, Taste, TDS, Total Hardness, Calcium hardness, Magnesium hardness, Chloride, Fluoride, Sulphate, Nitrates, Alkalinity, Iron, Copper, Manganese	18 locations (surface + ground waters) in and around grinding unit	Once in a Month	Environment engineer
3.	Soil Quality Analysis	pH, Electrical Conductivity, Texture, Salinity, Alkalinity, Nitrogen, Phosphorus, Potassium, Chloride, Fluoride, Sulphate, TOC, Mercury Analysis	08 locations in and around the grinding unit (with respect to the downwind direction and 3 locations each at 120° directions)	Yearly	Environment engineer
4.	Noise Level	Day & Night dB (A)	08 locations on within 10-km radius around grinding unit.	Once in a Month	Environment engineer
5.	Medical Checkup	Spirometry, Audiometry, Biochemical	Pre-placement Medical Checkup	Yearly as per	Environment engineer, Plant

S. No	Attributes / Aspects	Monitoring Parameter	Location	Frequency	Responsibility
		Parameter (Sugar, Blood), ECG, Vision Test and Chest X-ray	Periodical Examination	Factories Act	Unit Head and HR Department
Operation Phase					
1.	Meteorological monitoring	Wind speed, Wind direction, Ambient temperature, Relative humidity, Rainfall	Project Site	Hourly continuous	Environment engineer and team
2.	Ambient Air quality Monitoring	PM ₁₀ , PM _{2.5} , SO ₂ , NO _x as per NAAQS, 2009	08 locations on within 10-km radius around grinding unit	Twice a Week	Environment engineer and team
3.	Fugitive Emission Monitoring	SPM	Cement Mill, Raw Materials Handling Area	Monthly	Environment engineer and team
4.	Stack Monitoring	PM _{2.5} , PM ₁₀	All Stacks	Monthly / Continuous Online Monitoring	Environment engineer and team
5.	Water Quality	pH, Turbidity, Colour, Odour, Taste, TDS, Total Hardness, Calcium hardness, Magnesium hardness, Chloride, Fluoride, Sulphate, Nitrates, Alkalinity, Iron, Copper, Manganese	18 locations (surface + ground water) in and around grinding unit	Monthly	Environment engineer and team
6.	Water Level	-	08 locations around plant site.	Quarterly	Environment Engineer
7.	Sewage Treatment Plant (inlet & Outlet)	pH, BOD, Oil & Grease, and TSS	Sewage Treatment Plant (Outlet) as per CTO	Once in a Month	Environment engineer and team
8.	Soil Quality Analysis	pH, Electrical Conductivity, Texture, Salinity, Alkalinity, Nitrogen, Phosphorus, Potassium, Chloride, Fluoride, Sulphate,	08 locations in and around the grinding unit (with respect to the downwind direction and 3 locations each at 120° directions)	Yearly	Environment engineer

S. No	Attributes / Aspects	Monitoring Parameter	Location	Frequency	Responsibility
		TOC, Mercury Analysis			
9.	Noise Level	Day & Night dB (A)	08 locations and near all noise sources in and around the grinding unit. All noise sources within the plant premises	Once in a Month	Environment engineer
10.	Medical Checkup	Spirometry, Audiometry, Biochemical Parameter (Sugar level, Blood), ECG, Vision Test and Chest X-ray	Pre-placement Medical Checkup Periodical Examination	Yearly as per Factories Act	Environment engineer, Plant Unit Head and HR Department

6.2 Emission and Discharge from the Plant

The details of emission monitoring system installation are given in **Table E16**.

TABLE-E16: DETAILS OF EMISSION MONITORING SYSTEM INSTALLATION

Particulars	Off-Line Monitoring as per (3rd party monitoring – Monthly)	On-Line Monitoring Parameters
A. Stack Monitoring		
Grinding Mill	CPCB standard & Consent to Operate	PM
B. Industrial Wastewaters		
Inlet & Outlet of the STP	CPCB standard & Consent to Operate	pH, Total Suspended Solids, BOD, Oil and grease.

6.3 Greenbelt Development

- Total project area is 84.14 Ha, out of which approx. 29.20 ha. (i.e., ~ 34.70 % will be developed under greenbelt plantation. Presently, 25.0 Ha (29.72 %) of area is fully developed as greenbelt and the remaining area is under development.
- The greenbelt will develop with 2500 trees/Ha and with survival rate of 90% after gap filling and development of the area allocated for greenbelt.

6.4 Social Parameters

The company will propose plans to supplement the existing governmental programs among the local population. Environmental awareness is being/will be created among people by organizing awareness camps. Keeping the view of achieving the national objective of sustainability, developmental activities will be carried out.

7.0 ADDITIONAL STUDIES

7.1 Risk assessment

Risk assessment is the measure of quantitative or qualitative value of risk related to a concrete situation and a recognized threat. Activities requiring assessment of risk due to occurrence of most probable instances of hazard and incident are both onsite and off-site. Details of Risk Assessment and mitigation measures to be adopted is given in **Table E17**.

TABLE-E17: RISK ASSESSMENT & MITIGATION MEASURES

S. No.	Activity	Associated hazards	Associated risk/ health impact	Mitigation Measures
1	Storage & handling of raw material	Dust	Air pollution due to fugitive emissions	<ul style="list-style-type: none"> • Use of PPEs. • Continuous water sprinkling • Training to workers for proper handling • Proper system with high efficiency bag filters for loading & unloading operations • Firefighting & first aid facility. • Covered Storage provision • Proper housekeeping facilities
2	APCD failure	Dust	Air pollution	<ul style="list-style-type: none"> • Regular monitoring & inspection will be done. • The plant shall be stopped on APCD failure
3	Working at height	Slip, trips & falls of operators	Physical injuries	<ul style="list-style-type: none"> • Individual alertness of the workers – by imparting training. • First aid boxes shall be provided
4	Electrical maintenance work	Electric shock, short circuits in power room	Electrical shocks, Injury or burn	<ul style="list-style-type: none"> • Regular checking and maintenance of electrical units • Individual alertness of the workers – by imparting training. • Use of PPEs • Provision of First aid box
5	Working near noise producing equipment	High noise	Noise induced hearing losses	<ul style="list-style-type: none"> • Provision of PPEs to the workers.

7.2 Occupational Health Measures

Details of Occupational Health Measures to be adopted at plant is given in **Table E18**.

TABLE-E18: OCCUPATIONAL HEALTH MEASURES

Hazard	Measures
Dust	<ul style="list-style-type: none"> ▪ Implementation of adequate dust control systems and good housekeeping. ▪ Water sprinkling in the places where dust dispersion can occur. ▪ Regular sweeping of roads within plant premises ▪ Providing dust masks to employees working in handling and storage yards. ▪ Periodic work zone monitoring

Noise	<ul style="list-style-type: none"> ▪ Proper maintenance of machineries ▪ Installation of compressors in closed buildings ▪ Regular monitoring of noise level ▪ Display of noise level with permission level ▪ Display instructions for using PPEs at high noise level area ▪ Periodic health checkup for Audiometry for the individuals working in high noise area
Electrical Hazards	<ul style="list-style-type: none"> ▪ Proper Earthing as per IS 3043 will be done ▪ Double Insulated Tools ▪ Over Load Protection ▪ Protection Against Leakages (G.F.C.I.) ▪ Lightning Protection ▪ Protection against Static Electricity and safely using ladders and scaffolds
Fire and Explosion	<ul style="list-style-type: none"> ▪ Suitable fire extinguisher, fire buckets and fire hydrant system. Dry power type in oil and fire buckets will be kept near transformer, cable, general store and office area. Hydrant line at all location in plant area along with clinker storage area. Fire tender is to be kept ready at plant main gate. ▪ Oil and Flammable Gases storage area will be fenced and declared as Fire Hazardous Area-No Smoking Area” ▪ Permit and safety instruction will be given to use welding / gas cutting in the area of oil, gas, and bag go down. ▪ Predictive interlock in transformers so as to give alarm and trip the system. ▪ Adequate height of brick walls for separation of all transformers, soak pits for storage of oil leakages from transformers will be done.
Other Hazards	<ul style="list-style-type: none"> ▪ Structural soundness of silos and buildings. ▪ Installing light arrestors at all tall buildings. ▪ Permit to be taken to work at height with work instruction to use safety belts etc. ▪ Testing of all lifting tools, tackles and pressure vessel to avoid failure. ▪ Safe working pressure maintained in air receiver. ▪ Safe working load on cranes and ropes etc. ▪ Good house-keeping & Speed limit of vehicles is/will be 20 km/hr. inside the proposed plant area. ▪ Display of emergency number at all suitable location. ▪ Fire tender, ambulance and emergency staff ready at the plant main gate at all the time ▪ First aid kits are kept at the sites and training provided ▪ Use of mobile while driving, alcohol, smoking etc. are ban inside the proposed plant area. ▪ Proper illumination in plant area (100 to 150 LUX), office (250 to 300 LUX) and road area (20 to 30 LUX)

7.3 Public consultation

The Draft EIA/EMP report has been submitted to SEIAA, Maharashtra for public hearing. Action plan will be prepared and submitted after the conduction of public hearing.

7.4 Action Plan to Address the Issues Raised During Public Consultation

Action plan will be provided after the completion of public hearing.



8.0 PROJECT BENEFITS

The proposed expansion project will provide various benefits across the nearby areas which are attributed below:

8.1 Employment Benefits (Direct & Indirect) due to the Project

Total manpower for the project is estimated around 338 persons during operational phase and 525 persons will be employed for construction phase. Details of manpower requirement is given in **Table E8**.

8.2 Economic Benefits

Special emphasis on financial benefits is being/will be given to the local people. Business opportunities for the local people will be enhanced like transport of cement in the market, maintenance & housekeeping contract work etc.

8.3 Social Benefits

The operation zone for the Socio-economic development activities for the proposed project will be provided to the nearby villages of project site. The company will propose plans to supplement the existing governmental programs among the local population. Environmental awareness is being/will be created among people by organizing awareness camps. Keeping the view of achieving the national objective of sustainability, developmental activities will be carried out.

9.0 COST FOR ENVIRONMENTAL POLLUTION CONTROL MEASURES

Capital cost for the expansion project is Rs. 275.0 Crores. The budget proposed for the proposed project and that for the environmental protection measures are given in **Table E20**.

TABLE-E20: COST BREAK UP OF EMP

S. No.	Description of item	Cost (Rs. In Cr)			
		Existing Project	Annual Recurring	Proposed Expansion Project	Annual Recurring
1.	Air Pollution Control Systems	2.2	0.09	17	0.8
2.	Sewage Treatment Plant/Water Treatment Plant	0.2	0.03	-	0.05
3.	Environmental Monitoring Instruments and Laboratory	0.8	0.08	0.2	0.2
4.	Greenery Development & maintenance	0.6	0.04	0.24	0.12
5.	Safety and Risk Management	0.1	0.01	0.3	0.2
6.	Others	0.1	0.00	0.1	0.05
Total		4.0	0.25	17.84	1.42

