

Environment Impact Assessment report for Expansion of Existing Cement Grinding Unit from 2.4 to 4.0 MTPA

at

**Village- JalaDhulagori,
Tehsil-Sankrail, District-Howrah (West Bengal)
by M/s. Ambuja Cements Limited (Unit:Sankrail)**

Type of Project: Expansion Project

Category as per EIA notification 2006 and its amendments: Activity 3(B), Cement Plant
Category- B (Appraised at MOEF&CC)

Total Plot Area: 32.64 Ha (Existing Unit – 18.36 ha + proposed Expansion area -14.28 ha)

Cost of Project: ₹400Crores

TOR Letter No.: No.J-11011/547/2010-IA.II(I) dated 15.02.2022

BASELINE PERIOD: 1stMarch,2022 to 31stMay,2022

LABORATORY: J.P. Test and research Center (NABL & MOEF&CC accredited Lab)

ENVIRONMENT CONSULTANT:



(Approved Consultant)



EQMS INDIA PVT LTD.

**Accreditation No.: NABET/EIA/1922/RA0197
valid till 23.11.2022**

304-305, 3rd Floor, Plot No. 16, Rishabh Corporate Tower,
Community Centre, Karkardooma, Delhi – 110092
Phone: 011-42270087, 43062757.
Website: www.eqmsindia.com ;
E-mail: skjain@eqmsglobal.com

PROJECT PROPONENT

Ambuja Cements Limited
Unit:Sankrail
PS: Sankrail, Dist: Howrah
State: West Bengal
Pin:711302

Email: sanjeewkumar.singh@ambujacement.com

UID No.: EQMS/EIA/ACL/3(b)/P No. IA/WB/IND/248462/2021

Report Release Date: 26/07/2022

Revision No: 01

REPORT RELEASE

Ambuja Cement Limited (Sankrail Unit)

EIA Report for Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail, District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail).

© EQMS India Pvt Ltd ('EQMS'), July 2022

This report is released for the use of Ambuja Cement limited (ACL) Sankrail, Regulators and relevant stakeholders solely as part of the subject project's Environmental Clearance process. Information provided (unless attributed to referenced third parties) is otherwise copyrighted and shall not be used for any other purpose without the written consent of EQMS.

PROJECT DETAILS							
Name of Publication	EIA Report for Expansion of Existing cement Grinding Unit at Village-JalaDhulagori, Tehsil-Sankrail, District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail).						
Project Number	PR-	Report No.	1	Version	1	Released	July 2022
Managed By	Manager EIA		Released By		EIA Co-ordinator		
CONTACT DETAILS							
Head Quarter: Delhi / NCR EQMS India Pvt. Ltd. 304 & 305, 3rd Floor, Rishabh Towers, Plot No. 16, Community Centre, Karkardooma, Delhi - 110092. (India) Email: eqms@eqmsindia.org; T: + 91-11-30003200/219; F: +91-11-22374775							
DISCLAIMER							
EQMS India Pvt Ltd has taken all possible precautions in the preparation of this report as per its auditable quality plan. EQMS also believes that the facts presented in the report are accurate as on the date it was written. However, it is impossible to dismiss absolutely, the possibility of errors or omissions. EQMS therefore specifically disclaims any liability resulting from the use or application of the information contained in this report. The information is not intended to serve as legal advice related to the individual situation.							

TABLE OF CONTENTS

Chapter 1. Introduction	17
1.1. Preamble	17
1.2. Brief About Project	17
1.3. Project Proponent	18
1.4. Need of the Projects and Its Important to the region	18
1.5. Nature size of the Project	19
1.6. Project Benefit	21
1.7. TOR Compliance	22
1.8. Structure of the Report	31
Chapter 2. PROJECT DESCRIPTION	34
2.1. Type of Project	34
2.2. Site Location and Surrounding	34
2.3. Infrastructure Requirement	39
2.4. Process Description	43
Chapter 3. DESCRIPTION OF THE ENVIRONMENT	54
3.1. Introduction	54
3.2. Background and Salient Environmental Features of the Study Area	54
3.3. Components of Methodology of Baseline Survey	61
3.4. Topography, Physiography and Drainage	65
3.5. Geology & Hydrogeology	68
3.6. Land use- Land Cover Classification	70
3.7. Soil Environment	77
3.8. Water Environment	85
3.9. Air Environment	95
3.10. Ambient Air Quality	98
3.11. Noise Environment	103
3.12. Ecology and Biodiversity	105
3.12.1. Terrestrial Ecology	106
3.12.2. Forest/Vegetation Howrah District	106
3.12.3. Critical Environmental Resources in Project Study Area	106
3.12.4. Vegetation Type in Study Area (10 km study Area)	107
3.12.6. Plantation in the study area:	111
3.12.7. Rare/Endangered/Threatened (RET) Plants	112
3.12.8. Faunal Biodiversity	112
3.13. Socio-Economic Environment	116
Chapter 4. ENVIRONMENT IMPACTS AND IDENTIFICATION	131
4.1. Introduction	131
4.2. Summary of Baseline of Project Area	131
4.3. Identification of Project Activities and Associated Impact	133
Impact Identification	133
4.4. Impact Assessment and Evaluation	135
4.5. Impacts during Implementation/Construction Phase	135
4.6. Impacts During Operation phase	146
Chapter 5. ENVIRONMENT MONITORING PROGRAMME	158
5.1. Environmental Monitoring Plan	158
5.2. Stack Emission Monitoring	159
5.3. Ambient Air Monitoring (Fugitive Dust and Ambient Air Quality)	160

5.4.	Equipment and Ambient Noise Monitoring	161
5.5.	Water and Wastewater Quality Monitoring	161
5.6.	Solid Wastes Monitoring	162
Chapter 6.	ADDITIONAL STUDIES	164
6.1.	Risk Assessment	164
6.2.	Disaster Management Plan	166
6.3.	Corporate Social Responsibility	172
Chapter 8.	PROJECT BENEFITS	178
8.1.	Benefits to the Country	178
Chapter 9.	ENVIRONMENT MANAGEMENT PLAN	180
9.1.	Introduction	180
9.2.	Objective of Environmental Management Plan	181
9.3.	Environmental Management Plan	181
9.4.	Institutional Framework for Implementation of EMP	194
9.4.2.	Roles & Responsibilities of the Environment Management Cell	194
9.4.3.	Institutional Arrangement	195
9.5.	Energy Saving Measures	195
9.6.	Environment Policy of ACL	196
9.6.1.	Training Requirement of Staff:	198
9.7.	Management of Construction Site	198
9.8.	Road Traffic Management	199
9.9.	Human Health and Safety Plan	200
9.10.	Greenbelt Development Plan	201
9.11.	Rehabilitation and Resettlement Plan	211
9.12.	Risk Management	211
9.13.	Occupational Health Management	212
9.14.	Rain Water harvesting plan	218
9.15.	Compliance with CREP Recommendations	219
9.16.	Budget for Pollution Control and Environmental Management	221
Chapter 10.	SUMMARY & CONCLUSION	222
Chapter 11.	DISCLOSURE OF CONSULTANTS	225

LIST OF TABLES

Table 1.1 :	Size and Capacity of the Project	20
Table 1.2 :	Salient Features of the project	20
Table 1.3 :	Details of Permits and Clearance Applicable and its Status	21
Table 1.4 :	TOR Compliance	22
Table 2.1 :	Plant Area Break-Up	39
Table 2.2 :	Water Requirement	40
Table 2.3 :	Fuel Requirement	41
Table 2.4 :	Raw Material Requirement, Source & Transportation	43
Table 2.5 :	Proposed Plant Facilities	44
Table 2.6 :	Material Balance of Cement Grinding Unit (4840 MT/Day)	46
Table 2.7 :	Details of the fugitive dust generation points and APCs (Existing Unit)	49
Table 2.8 :	Details of the fugitive dust generation points and air pollution control system (Proposed Expansion)	50

Table 3.1 : Environmental Sensitivity of Proposed Site and Study Area	56
Table 3.2 : Summary of Methodology for Primary/Secondary Baseline Data Collection.....	62
Table 3.3 : Pre-monsoon Depth to Water level in Howrah District	69
Table 3.4 : Post-monsoon Depth to Water level in Howrah District.....	69
Table 3.5 : Land use of the Study Area.....	74
Table 3.6 : Soil Sampling Locations.....	77
Table 3.7 : Method for Analysis of Soil Properties	78
Table 3.8 : Physicochemical Characteristics of Soil	80
Table 3.9 : Soil Reaction Classes.....	81
Table 3.10 : Soil Class Interpretation.....	83
Table 3.11 : Water Quality Sampling Stations	86
Table 3.12 : Ground water Quality	88
Table 3.13 : Water Quality Classification based on WQI Value	91
Table 3.14 : Ground Water Quality Index	91
Table 3.15 : Surface Water Quality Criteria as per CPCB	92
Table 3.16 : Surface Water Quality.....	92
Table 3.17 : Water Quality Classification and Best Designated Use	95
Table 3.18 : Surface Water Quality Index	95
Table 3.19 : Climate Data of IMD Kolkata (1981-2010)	95
Table 3.20 : Summary of Site-Specific Meteorological Data	97
Table 3.21 : Location of Air Monitoring Stations	99
Table 3.22 : Sampling Methodology	100
Table 3.23 : Summary of Ambient Air Quality.....	100
Table 3.24 : AQI Category for Monitoring Station	102
Table 3.25 : AAQ category index.....	103
Table 3.26 : Ambient Noise Quality Monitoring Locations.....	104
Table 3.27 : Ambient Noise Leq at Monitoring Location	105
Table 3.28 : Type of Forest present in Howrah District.....	106
Table 3.29 : List of Flora reported in Study Area (trees and Shrubs).....	108
Table 3.30 : List of Flora (Herbs, Climbers & Grasses) in Study Area.....	110
Table 3.31 : List of Plant species used for Plantation in study area.....	111
Table 3.32 : Mammals Observed within Core Zone.....	113
Table 3.33 : Amphibians and Reptiles Observed within Core Zone	113
Table 3.34 : Avifauna Observed with in Core Zone	113
Table 3.35 : List of the Mammals observed in Buffer Zone.....	114
Table 3.36 : List of Amphibians and Reptiles observed in Study Area	114
Table 3.37 : List of the Birds observed in the Study Area	115
Table 3.38 : Population Distribution in the 10 km Radius Study Area.....	117
Table 3.39 : Distribution of Work Participation Rate	124
Table 3.40 : Composition of Non-Workers.....	125
Table 3.41 : Village wise Basic Amenities in Study Area	128
Table 4.1 : Summary Baseline Scenario of Project Area and Likely extent of Impact	131
Table 4.2 Source, object and scope of environment impact	134
Table 4.3 Typical Noise Sources during Construction Phase	138
Table 4.4 : Minimum Distance Required from Different Land Use (Pre-construction phase) to Achieve Prescribed Noise Levels as Per Noise Rules, 2000.....	139
Table 4.5 : OSHAS Noise Exposure Limits for The Work Environment	141
Table 4.6 : Air Emission Inventory of the Proposed CGU.....	147

Table 4.7 : Details of the fugitive dust generation points and air pollution control system (Proposed Expansion)	147
Table 4.8 : Max. Ground Level Concentration	148
Table 4.9 : Ground level concentration at monitored location	148
Table 4.10 : Name of Dust Pollution Control System in CGU	149
Table 4.11 : Name of Traffic Survey Location	155
Table 4.12 : The existing road conditions are described below:	155
Table 4.13 : Summary of Traffic Volume Count	155
Table 5.1 : Name of Instruments Required for Environmental Monitoring	159
Table 5.2 : Stack Emission monitoring Plan	160
Table 5.3 : Ambient Air monitoring Plan	161
Table 5.4 : Equipment and Noise monitoring Plan	161
Table 5.5 : Water and wastewater sampling Plan	161
Table 5.6 : Solid waste Monitoring Plan	162
Table 6.1 : Details of the expenses done by ACL under CSR/CER	174
Table 6.2 : Proposed CSR Budget for proposed expansion project	177
Table 9.1 : Environment Management Plan during Construction and operation Phase	182
Table 9.2 : Details of Tree Species Planted	202
Table 9.3 : Details of Proposed Tree Species	205
Table 9.4 : Budget Allocation for Proposed Green Belt Development	207
Table 9.5 : Amount of Carbon sequestered by Proposed Plantation	210
Table 9.6 : Investment on Environmental Protection Measures	221

LIST OF FIGURES

Figure 2.1 : Project Boundary Map	35
Figure 2.2 : Project Location Map	35
Figure 2.3 : Topo Map of the Project Site and surrounding 10 km area	36
Figure 2.4 : Google Map showing the project site and surrounding 10 km area	37
Figure 2.5 : Photographs of Existing Plant and proposed expansion are	38
Figure 2.6 : Plant Layout	42
Figure 2.7 : Process Flow Sheet (Cement Manufacturing)	47
Figure 2.8 : Schematic Flow Diagram of STP	52
Figure 3.1 : Study Area TopoMap	55
Figure 3.2 : Close view map of the project area	58
Figure 3.3 : Location Map showing Environmental Features within 10 km Area	59
Figure 3.4 : Google Map showing Environmental Features within 10 km Area	60
Figure 3.5 : Sampling location Map	64
Figure 3.6 : Location Map of Jalan Industrial Complex	65
Figure 3.7 : Digital Elevation Map of Study area	67
Figure 3.8 : Drainage Map of Study Area (10 km Radius)	68
Figure 3.9 : Graph Showing Land Use of the Study Area (10 km Radius)	75
Figure 3.10 : Land Use Map of the Study Area (10 km Radial Zone)	76
Figure 3.11 : Soil Texture Triangle	82
Figure 3.12 : Site-specific Windrose Diagram	97
Figure 3.13 : Wind Frequency Diagram	98
Figure 3.14 : Male-Female wise Population Distribution in the Study Area	122

Figure 3.15 : Scheduled Caste Population in the Study Area	122
Figure 3.16 : Scheduled Tribes Population in the Study Area	123
Figure 3.17 : Male-Female wise Distribution of Literates & Illiterates	123
Figure 3.18 : Composition of Main Workers Population	124
Figure 3.19 : Composition of Marginal Workers	125
Figure 3.20 : Composition of Non-Workers	125
Figure 4.1 : Noise Levels at Various Distances from Construction Equipment	140
Figure 4.2 : Predicted GLC of PM10	150
Figure 4.3 : Predicted Noise Level– (source strength 94 dBA)	152
Figure 9.1 : Organization Structure of Environment monitoring Cell	194

LIST OF ABBREVIATIONS

ACL	Ambuja Cement Limited
ToR	Terms of Reference
EIA	Environment Impact Assessment
AAQ	Ambient Air Quality
APHA	American Public Health Association
BDL	Below Detection Level
BIS	Bureau of Indian Standards
CPCB	Central Pollution Control Board
MoEF&CC	Ministry of Environment, Forests & Climate Change
TPD	Tons per Day
SO ₂	Sulphur Di Oxide
CTE	Consent to Establish
CTO	Consent to operate
MTPA	Metric Tones Per Annum
NOC	No Objection Certificate
EAC	Expert Appraisal Committee
B	Boron
Zn	Zinc
KLD	Kilo Litre per Day
N	North
S	South
E	East
W	West
NE	Northeast
SW	Southwest
NH	National Highway
Km	Kilometer
M ²	Squaremeter
Kg	Kilogram
HDPE	High Density Polyethylene
PP	Polypropylene
PM	Particulate Matter
ETP	Effluent Treatment Plant
kVA/ KW	Kilo Volt ampere/ Kilo watt
DG	Diesel Generator
F	Fluoride
NO ₂	Nitrogen Dioxide
HC	Hydrocarbon
NH ₃	Ammonia
STP	Sewage Treatment Plant
GLC	Ground level Concentration
Mg/ Nm ³	Milligram per Normal meter cube
DDS	Dedusting System
SPCB	State Pollution Control Board
dBA	Decibel (A)
CER	Corporate Environment Responsibility
QA/QC	Quality Assurance/ Quality Control
SRTM	Shuttle Radar Topography Mission
GIS	Geographic Information System

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

CGWB	Central Ground Water Board
FCC	False Color Composite
µg/m ³	Microgram per metercube
PCU	Passenger Car Unit
IRC	Indian Road Congress
BDU	Best Designated Use
GW	Ground water
CaCO ₃	Calcium Carbonate
Mbgl	Meter below ground level
IUCN	International Union for Conservation of Nature's
CO	Carbon Monoxide
APCM	Air Pollution Control Measures
PUC	Pollution Under Control
PPEs	Personal protective equipment
VOC	Volatile Organic Carbon
USEPA	United State Environmental Protection Agency
AERMOD	Atmospheric Dispersion Modeling System
TSDf	Treatment, Storage, And Disposal Facility
ZLD	Zero Liquid Discharge
RET	Rare, Endangered and Threatened
EMP	Environment Management Plan
DMP	Disaster Management Plan
RSPM	Respirable suspended particulate matter
WBPCB	West Bengal Pollution Control Board
EHS	Environment Health & Safety
EMC	Environment Management Cell
LDO	Light Diesel Oil
HSD	High Speed Diesel
EPP	Emergency Preparedness Plan
LED	Light Emitting Diode
NAAQS	National Ambient Air Quality Standards
NA	Not Applicable
NH	National Highway
QRA	Quantitative Risk Assessment
MWH	Mega Watt per Hour
MT/Hr	Metric Tonnes per Hour
EAC	Expert Appraisal Committee
TOR	Terms of Reference
EIA	Environment Impact Assessment
OM	Office Memorandum
MoEF&CC	Ministry of Environment, Forests and Climate Change

EXECUTIVE SUMMERY

1.0 Introduction

M/s. Ambuja Cements Limited (ACL) has an existing stand-alone Cement Grinding Unit of 2.4 MTPA capacity at Village - Jala Dhulagori, Tehsil - Sankrail, District - Howrah (West Bengal). Ambuja Cement Plant Sankrail is started in 2001 with an entire annual capacity of one million tonnes of cement. Ambuja Cement Limited (ACL) is the franchisee of the cement plant and the type of franchisee is Private. Ambuja Cement Plant of Sankrail is one among the top cement manufacturer of India.

M/s. Ambuja Cements Limited (Unit: Sankrail) is now proposing Expansion in Cement Production Capacity from 2.4 MTPA to 4.0 MTPA of Existing Stand-alone Grinding Unit at Village: Jala Dhulagori, Tehsil: Sankrail, District: Howrah (West Bengal).

As per the Environmental Impact Assessment Notification, 2006 and amendments thereof, proposed Expansion project (Cement Grinding Unit) falls under category "B" and Section 3(b) of its schedule. But the site is located proximity to Critically polluted area of Jalan Industrial Complex-I (Howrah) hence to be appraised as category A.

The terms of Reference (ToR) for EIA study of proposed expansion were accorded by MOEF&CC vide letter no. No.J-11011/547/2010-IA.II(I) dated 15th Feb 2022. The Draft EIA report has been prepared as per the ToR issued by MOEF&CC.

Proposed expansion will be done within the existing plant area. No additional land will be acquired for the proposed expansion. Total area available with the ACL at Sankrail unit is 32.64 ha. Out of the total area existing plant is located in 18.36 ha. Rest of the 14.28 ha has been proposed for said expansion.

Location: Proposed plant site is located at Village: Jala Dhulagori, Tehsil: Sankrail, District: Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail). The site is well connected to NH - 6 (~0.2 km in NW direction) and NH - 117 (~7.5 km in ENE direction). Nearest town is Andul (~5.5 km in ENE direction). Nearest Railway Station is Sankrail Railway Station (~1.5 km in ESE direction). Nearest Airport from plant site is Kolkata Airport (~26.5 km in NE direction). Hoogly River is nearest river flowing at 4.0 km (ESE) from the ACL project site. Project site lies under seismic zone III, with moderate risk. Jalan Industrial Complex is located about 3.07 km from the plant boundary, which is critically polluted area near the project site.

No presence of wildlife, reserved forests/Protected Forest/ wetlands/ mangroves/ are found within 10 km radius of the project site.

Project Cost: The estimated cost of the expansion project is Rs. 400 crores.

Employment: The expansion project will create the employment for 1000 people during construction phase and 140 during operation phase.

Water Requirement: The water consumption for grinding unit will be low as the requirements are only for cooling system and the water will be re-circulated in a closed system. Only make up for water will be required for meeting the evaporation losses in the cooling circuit. The source of water would be from the ground water. Water for drinking and domestic purposes will be needed additionally. Fresh Water requirement for existing grinding unit is about 180 KLD. For proposed expansion about 90 KLD fresh water and 40 KLD recycled water shall be required. After expansion total freshwater requirement will be 270 KLD. Water requirement of existing as well as proposed expansion unit shall be sourced from ground water. ACL has already obtained Permission for ground water withdrawal (270 KLD) from West Bengal Ground Water Resources for the existing as well as proposed expansion unit.

Power Requirement: Power requirement for existing unit is 13 MW. Power requirement for the proposed project is estimated be 12 MW. Total power requirement after expansion will be 25 MW. Power will be sourced from West Bengal Power Development Corporation (WBPDCL). Existing D.G. Set (22380 KVA) will be used for back-up in proposed expansion also.

Cement Manufacturing Process: ACL uses state-of-the-art technology for manufacture of cement. All raw materials such as Clinker, fly ash, gypsum and slag came in via road or railways. The cement manufacturing will be based on dry process technology with closed circuit grinding unit and automated rotary packers. For PCC Production Clinker, Slag, Conditioned fly ash/ Dry fly ash and Gypsum is grounded in Vertical Roller mill. For PPC and Clinker, dry fly ash and gypsum is grounded in Roller press(existing)/ Ball mill(existing)/Verticle roller mill(proposed)I and stored in Cement silo after classification in separator. Cement from the cement grinding section will be transported to the storage silo by a system of air slides and bucket elevator. From silos PPC & PCC would be extracted and packed in HDPE bags of 50 kg weight by rotary type electronic packer and stored in a go down or loaded on to the trucks with the help of semi automatic/automatic truck loaders.

2.0 Description of Environment

The baseline study and primary data collection has been carried out during 1st March 2022 to 31st May 2022. 10 km area around the existing plant boundary was considered as study area. Data was generated by following the standard procedures of the Ministry of Environment & Forests and the Central Pollution Control Board. Meteorological data on wind speed, wind direction, relative humidity and temperature was generated at site. Baseline ambient air quality was measured at 8 locations within the core and buffer zone. Noise levels were measured at 8 locations. Surface water quality of 3 locations, groundwater quality of 8 locations and soil quality of 6 locations was collected and analyzed. Data on plants and animals present in the core and buffer zone was collected from the published literatures and checked during field survey. Data on demography, occupation pattern, cropping pattern, infrastructure facilities were collected from District

Statistics Handbook and Primary Census of India 2011. Land use, drainage and contours were estimated using the recent satellite imagery. The study area falls under Seismic Zone III.

Meteorology: The predominant wind direction is from south and southwest direction. The average wind speed is 5.39 m/s and ranges from 0.5 to 6.3 m/s. Daily mean temperature varied from 17°C to 42.2°C. The relative humidity varied from 51 to 74%. The annual rainfall is 1836.5 mm.

Air Quality: PM_{2.5}, PM₁₀, SO₂, NO₂ and carbon monoxide 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 project, including roadside villages. The highest PM₁₀ level were found at Jalan Industrial Area (117.8 µg/m³) and lowest PM₁₀ level (45.8 µg/m³) were observed at Sarathpalli. The highest PM_{2.5} level were found at Ghoraghat (58 µg/m³) and lowest PM_{2.5} level were observed at Sarathpalli (17.7 µg/m³). The highest SO₂ level were found at project site (14.9 µg/m³) and lowest SO₂ level were observed also at Debalpur (5.7 µg/m³). The highest NO₂ level were found at Jalan Industrial Complex (27.3 µg/m³) and lowest NO₂ level were observed at Sarathpalli (9.1 µg/m³). CO conc. was found in the range of 0.25 to 0.78 mg/m³. Overall, the ambient air quality of the study area is meeting the prescribed National Ambient Air Quality Standard at all locations except Jalan Industrial Complex where the PM level was found above the NAAQS.

Noise Quality: Ambient noise levels were monitored at 8 locations in the study area. The baseline noise levels are well within the National Standards for residential area (R), commercial area (C) and industrial area (I).

Water Quality: Three surface water samples and eight groundwater samples were collected from the study area for chemical and biological analysis. The analysis results indicate that the pH ranged between 7.23 to 7.53, which are well within the specified standard of 6.5 to 8.5 limit. Total hardness was recorded to range from 280 to 568 mg/l, which is within the permissible limit 600 mg/l at all locations. The Total Dissolved Solids (TDS) concentration recorded ranged between 452 to 1729 mg/l and was within the permissible limits (2000 mg/l) at all locations. Chlorides at all the locations were within the permissible limits (1000 mg/l) as it ranged between 72 – 652 mg/l. Sulphates at all the locations were within the permissible limits (400 mg/l) as it ranged between 26 – 63 mg/l. Bacteriological studies reveal that no coliform bacterial are present in the samples. The heavy metal contents were observed to be in below detectable limits. All physical and general parameters were observed within the permissible limit as per IS10500:2012 (Second Revision).

The surface water Quality: The Hooghly River water quality parameters are compared with BDU Criteria of CPCB. The river water quality with respect to pH, DO, BOD coliform and

COD in Hooghly River in both the sampling location comply with the Class C of BDU Criteria of CPCB. The drain water quality is polluted.

Soil Quality: The soil texture is found to be Sandy Clay Loam. The soil pH ranges were observed from 6.99 to 7.81 during study season, thereby indicating the soil are vary from Neutral to Slightly Alkaline in nature. Available nitrogen content in the surface soils ranges between 188 kg/ha to 312 kg/ha thereby indicating that soils are Low to Medium in terms of available nitrogen content. Available phosphorus content ranges between 9.4 kg/ha to 16.1 kg/ha thereby indicating that soils vary from Low to Medium in available phosphorus. Available potassium content ranges between 158 kg/ha to 268 kg/ha thereby indicating that the soils are Medium in potassium content.

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, wetland, national park, wildlife sanctuary and Forest are present within 10 km distance of the project site.

3.0 Environmental Impact and Mitigation Measures

Air Quality: Air pollution during construction phase will be controlled using water sprinkling. Air pollutants from cement grinding unit comprise dust emission from cement mill and fugitive dust from material handling, storage silos and packing plant. The crusher, cement mill, storage silos, cement packing plant will be provided with bag filters for dust separation. The outlet dust concentration will be limited to 30 mg/Nm³ (As per Notification GSR 612 E – dated 25-8-2014 the PM emission limit for standalone Clinker Grinding Plant (effective from 01-01-2016). DG set will be operated only during emergency.

Water Environment: No wastewater will be generated from the grinding process. Non-process wastewater will be generated (32 KLD) from workshop, laboratory, toilets and washrooms. The effluent shall be treated in the Treatment Plant. Treated water will be used for gardening. No wastewater will be discharged outside the plant premises. Spent oil and lubricants will be collected in drums and sold to authorized preprocessors. Sedimentation basin with oil water separator will be provided in storm water drains. Storm water will be discharged into nearby nalla.

Noise Quality: Material handling operations and movement of trucks will be properly scheduled to minimize construction noise. The air compressors, rotating machines, pumps, crusher and grinding 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. In noisy work areas soundproof duty rooms will be provided. Workers working in noisy areas will be given ear plugs and earmuffs. 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 daytime and 70 dBA during night time.

Land Environment: Out of the total area existing Plant is located in 18.36 ha. Rest of the 14.28 ha has been proposed for said expansion. The land is already in possession of ACL and land use has been changed into the industrial uses. The current land use of the site is agriculture fallow land. At present no agriculture is being done at this land. There is no trees present on the identified land however few herbs and grasses needs clearing.

Solid Wastes Disposal: The plant will not generate any solid waste from process. Dust collected from the air pollution control systems will be reused. 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 authorized vendors. Inert materials will be used as landfill. Biodegradable materials waste will be composted and used as manure for gardening. Used batteries will be given back to dealer or dispose to authorized vendors, while purchasing the new batteries.

Greenery Development: ACL has already developed a greenbelt in 4.86 ha in existing unit. ACL has proposed to develop a dense greenbelt in additional 5.91 ha area in proposed expansion. Hence after expansion of this project, green area will increase to total **10.77 ha i.e., 33% of total plot area**. In proposed expansion additional greenbelt shall be developed in 5.91 ha area. As per MoEF&CC guidelines for tree development of around 1500 no. of trees/ha, shall planted. Thus total approx. **8,865 no. of additional trees in 5.91 ha area** shall be planted under proposed expansion to maintain green area. Approx. a budget of **Rs. 42.28 lakh (Rs. 42,28,605/-)** have been earmarked for development of 8865 nos. of trees in proposed expansion under proposed greenbelt development programme.

4.0 Environmental Monitoring Plan

ACL is responsible for implementation of all the mitigation and management measures suggested in Environmental Monitoring Program. A separate department "Environmental Management Cell" (EMC) is established to look after all environmental related matters of the plant. The EMC supervises the reported activity from time to time for smooth implementation of Environmental Mitigation and Management measures and will take necessary actions if required. EMC will be responsible for the following functions:

I. Regular monitoring of –

- Monitoring of Ambient Air Quality at plant boundary for PM2.5, PM10, SO2, NO2, Ni, Pb, As.
- Work Zone Air Quality Monitoring near Mill, Loading and Unloading points, etc. for PM10.
- Monitoring of ground water quality of project site for pH, conductivity, total solids, hardness, chloride, sulphate, nitrate, fluoride, oil, heavy metals, etc. Observation well with piezometer shall be installed.
- Wastewater quality and quantity for pH, TSS, TDS, COD, Oil and Grease.
- Noise Level Monitoring at the plant boundary and inside work areas
- Monitoring the disposal of spent oil and grease, e-wastes and used batteries

- Development and maintenance of greenbelt and greenery inside the mining lease area.

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 storage tanks will be located and designed as per the guidelines. Firefighting system with fire extinguishers, hydrant system, sprinkler system, pumps and pipeline network shall be provided. Disaster Management Plan shall be implemented in consultation with the District Administration.

Occupational Health and Safety Management: The workers will be routinely checked for any clinical complaints and abnormal symptoms by the medical department. Workers will be given safety helmet, nose mask, ear plugs, clean drinking water and toilet facility. Regular safety training and awareness programs will be conducted.

6.0 Corporate Social Responsibility

ACL has spent Rs 263.39 lakh in year 2019-2020, Rs. 157.55 Lakhs in year 2020-2021 and Rs. 152.335 lakhs in year 2021-2022 in community development under CSR activities. For proposed expansion ACL has earmarked a budget of Rs. 300 Lakhs for undertaking CSR activities based on need-based analysis. This budget is for upcoming 3 years. This money will be spent for different CSR activities like agro based livelihood, women empowerment, health, and community welfare in surrounding villages.

7.0 Project Benefits

The benefits of the project can be summarized as:

- The proposed project will cater the current demand of cement mainly in West Bengal as well as its neighbour states.
- The project will generate additional revenue for the State Government. The additional cement availability will boost the infrastructure sector and the overall economic scenario of the region.
- During Construction period the project will generate around 1000 contractual people employment. After the project 140 people employment including permanent and contractual.
- For proposed expansion ACL has earmarked a budget of Rs. 300 Lakhs for undertaking CSR activities based on need-based analysis. This budget is for upcoming 3 years.
- This money will be spent for different CSR activities like agro based livelihood, women empowerment, health, and community welfare in surrounding villages.

8.0 Environmental Management Plan (EMP)

EMP for effective management of environmental impacts due to the proposed expansion project and ensuring overall protection of the surrounding environment through appropriate management procedures has been prepared.

The capital cost for environmental management of the proposed project is estimated to be **Rs 10 Cr.** This amount shall be used for procurement of pollution control during construction phase, Occupational Health & Safety of workers during construction phase, Water Supply & Drainage system, Storm water management, Solar streetlight within project area, wastewater management, environmental monitoring, CSR/CER and greenbelt development. About **Rs 0.50 Cr** would be required as annual recurring expenses to implement the EMP.

EMC will ensure that all air pollution control devices, wastewater treatment and water re-circulating systems function effectively. Contractor under the supervision of the company will do implementation of pollution control measures during construction phase. EMC will also ensure cleanliness and industrial hygiene in the plant. All records shall be submitted to the regulatory authorities (State Pollution Control Board), displayed at company gate and website.

CHAPTER 1. INTRODUCTION

This chapter provides background information of the project, need of the project, need of the EIA study, scope and EIA methodology adopted and structure of the report.

1.1. Preamble

M/s. Ambuja Cements Limited (ACL) has an existing stand-alone Cement Grinding Unit of 2.4 MTPA capacity at Village - Jala Dhulagori, Tehsil - Sankrail, District - Howrah (West Bengal). Ambuja Cement Plant Sankrail is started in 2001 with an entire annual capacity of one million tonnes of cement. Ambuja Cement Limited (ACL) is the franchisee of the cement plant and the type of franchisee is Private. Ambuja Cement Plant of Sankrail is one among the top cement manufacturer of India. The major manufacturing products of the cement plant are PPC, Compocem, Kawach and Roof Special.

Due to the plant's close proximity to prime markets and increasing demands of higher despatches over the years the plant capacity was increased to 1.5 million tonne per annum in the year 2010. With the recent modification the capacity has touched 2.4 million tonne per annum.

Environmental Clearance for the same has been obtained from MoEF&CC, New Delhi vide their letter no. J-11011/547/2010-IA II (I) dated 23rd June, 2011. The Plant operations in existing units are in full compliance with the conditions/norms stipulated in the Environmental Clearances awarded by the Ministry of Environment, Forest and Climate Change (MoEF& CC) and Consents to Operate granted by the State Pollution Control Boards (SPCBs).

1.2. Brief About Project

M/s. Ambuja Cements Limited (Unit: Sankrail) is now proposing Expansion in Cement Production Capacity from 2.4 MTPA to 4.0 MTPA of Existing Stand-alone Grinding Unit at Village: Jala Dhulagori, Tehsil: Sankrail, District: Howrah (West Bengal).

As per the Environmental Impact Assessment Notification, 2006 and amendments thereof, proposed Expansion project (Cement Grinding Unit) falls under category "B" and Section 3(b) of its schedule. But the site is located proximity to Critically polluted area of Jalon Industrial Complex-I (Howrah) hence to be appraised as category A.

The terms of Reference (ToR) for EIA study of proposed expansion were accorded by MOEF&CC vide letter no. No.J-11011/547/2010-IA.II(I) dated 15th Feb 2022. The Draft EIA report has been prepared as per the ToR issued by MOEF&CC.

Proposed expansion will be done within the existing plant area. No additional land will be acquired for the proposed expansion. Total area available with the ACL at

Sankrail unit is 32.64 ha. Out of the total area existing plant is located in 18.36 ha. Rest of the 14.28 ha has been proposed for said expansion.

1.3. Project Proponent

Ambuja Cement aspires to be the most competitive and sustainable company in the cement manufacturing industry. Acting in a sustainable manner is not only a business imperative but also provides the company with a competitive advantage. We believe that a company is not measured only through its profits; its True Value lies in what it gives back to the people and the environment. The core of our sustainability philosophy is based on shareholder benefit, safe operations, environment conservation and social well-being.

Ambuja Cements Ltd, a part of the global conglomerate Holcim, is one of the leading cement companies in the Indian cement industry. Operating for over 25 years, Ambuja has proved to be the best cement for construction and the best cement manufacturing company in India with its uniquely sustainable development projects

1.4. Need of the Projects and Its Important to the region

Ever since it was regulated in 1982, the Indian Cement industry has attracted huge investments both from India as well as foreign Investors. India has a lot of potential for development in the infrastructure and construction site and the cement sector is expected to largely benefit from it/Some of the recent major government initiatives such as development of 100 smart cities are expected to provide a major boost to the sector.

Indian government has set a target to invest INR 100 billion on developing infrastructure from 2019-2025. The target investment on infrastructure is to double the investment made during 2014-19. In view of INR 100 billion investment on infrastructure, Indian cement industry is estimated to have cement consumption of 593 MTPA and industry consumption is expected to cross 85% capacity utilization after 2022-23. The execution of government development of infrastructure is observed is high and even in many sectors it is found to be touching 90% level. Therefore, the cement demand is expected to touch 593 MT by 2024-25 in high growth scenario. All India projected cement demand in different economic scenario is as under:

Year	Economic Scenario		
	Present Growth	Modern Growth	High Growth (INR 100 Billion Infra (MT))
2019-20	331	337	340
2020-21	354	367	377
2021-22	374	393	422
2022-23	395	423	472
2023-24	418	455	529

2024-25	442	499	593
---------	-----	-----	-----

Source=India Cement market Study

The demand forecast gives a future prospect of Indian Cement industry and cement industry is expected to grow CAGR growth scenario 9.8% till 2025 in high growth scenario. The forecasted cement demand and industry capacity utilization shows that by 2022-23 industry will cross capacity utilization of 90%. Therefore, there is a scope for Indian cement industry to start new capacity addition projects to get advantage of future market demand.

Demand Supply Gap¹

The production of cement in India is expected to reach 410.21 Mn tons by FY 2024, expanding at a compound annual growth rate (CAGR) of ~3.83% during the FY 2019-FY 2024 period, owing to rising demand from the government and housing contractors. Cement consumption is anticipated to increase at a CAGR of ~4.38% during the forecast period owing to the sanction of schemes for improving roads and highways connectivity and housing facility related programs, and growing demand from the commercial real estate sector. To meet such rise in the demand, cement companies are expected to increase their production capacity over the next three years.

Imports vs. Indigenous production: The proposed expansion project will utilize locally available raw material and cement produced in the state will be consumed domestically. However, some Import will be required for imported Gypsum.

Export Possibility: Cement market for the Grinding Unit would be West Bengal, Chhattisgarh, Jharkhand, Odisha and eastern states. It is expected that in the near future, export of cement does not seem to be viable.

Domestic/ Export Markets: The entire production is envisaged for the domestic market. Cement market for the grinding unit would be West Bengal, Chhattisgarh, Jharkhand, Odisha and eastern states. This market has been identified keeping in mind the economic transportation system distance and location of othersupplying clusters and existing supply from others plants of the company. Employment will be generated (Direct and Indirect) due to the project.

1.5. Nature size of the Project

M/s. Ambuja Cements Limited (Unit: Sankrail) has proposes for Expansion in Cement Production Capacity (2.4 MTPA to 4.0 MTPA) of Existing Stand-alone Grinding Unit at

¹ India Cement Market Study 2019-2024: size & share, production & consumption, trade analysis, competitive landscape.

Village: Jala Dhulagori, Tehsil: Sankrail, District: Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail). Size and capacity is describes in **Table 1.1**. Salient feature of the project is presented in **Table 1.2**.

Table 1.1 : Size and Capacity of the Project

Unit	Existing capacity	Proposed Expansion Capacity	Total capacity after proposed expansion
Cement [Various Grade] (MTPA)	2.4	1.6	4.0
Cost of the Project	-	400 Cr.	400 Cr.
Land availability	18.36 ha	14.28 ha	32.64 ha
Land status	Land is already with ACL proposed expansion shall be done within the eisting premises		
Construction Completion period	-	18 month	--

Table 1.2 : Salient Features of the project

S. NO.	PARTICULARS	DETAILS
A	Location Details	
	Village	Jala Dhulagori
	P.O.	Sankrail
	P.S.	Sankrail
	District	Howrah
	State	West Bengal
	hLatitude	22° 33' 52.81" N to 22° 34' 27.41" N
	Longitude	88° 11' 29.89" E to 88° 11' 44.97" E
B	Area Details	
	Total Plant Area	32.64 ha (existing 18.36 ha + additional 14.28 ha); the same is under the possession of M/s. Ambuja Cements Limited (Unit: Sankrail)
	Greenbelt / Plantation Area (ha)	Existing unit: 4.86 ha Proposed Expansion: 5.91 ha Total after expansion: 10.77 ha i.e. (33% of the total project area)
C	Cost Details	
	Total Cost of the Expansion	400 Crores
	Cost for Environment Management Plan	Capital Cost –Rs 10 Crores Recurring Cost- 0.5 Crores/ annum.

D	Basic Requirements for the project	Existing	Additional for proposed Expansion	Total after Expansion
	Water Requirement (KLD)	180	90	270
		Source: Bore well & STP treated water		
	Power Requirement (MW)	13	12	25
		Source: WBSEDCL and DG set (For back up).		
	Manpower Requirement	Existing Plant: Permanent 82 and contractual labour 405 Proposed Expansion project: During Construction: contractual labour 1000 (approx.) During operation: Additional 140 people Approx		

1.6. Project Benefit

The benefits of the project can be summarized as:

- The proposed project will cater the current demand of cement mainly in West Bengal as well as its neighbour states.
- Sustain Quality leadership through deployment of state-of-the-art manufacturing technologies and improved thereof.
- Provide job opportunities and thus improvement in the living standard of local habitants.
- Establish monitoring program and provide procedures for addressing community concerns, if any;
- Improvement of indirect means of livelihood; and Generation of various infrastructures in the form of social capital for the community.

1.6.1. Regulatory Framework

Details of permits and clearance applicable to this project along with status are as under in **Table 1.3:**

Table 1.3 : Details of Permits and Clearance Applicable and its Status

S. No.	Permit /Clearance/Standards	For Proposed Expansion	Status
1	No Objection Certificate to Establish from West Bengal State Pollution Control Board (WBPCB) for the project	Mandatory	To be applied to WBPCB for proposed expansion.
2	Factory License	Mandatory	Already obtained for the existing plant
3	Water withdrawal Permission/ MOU	Required	Available for existing as well as proposed expansion demand
4	Consent to Operate from	Mandatory	Already have Consolidated

S. No.	Permit /Clearance/Standards	For Proposed Expansion	Status
	WBState Pollution Control Board (WBPCB) for the project under Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981		Consent and Authorization (CC&A) for existing plant from WBPCB. For the expansion phase, to be applied after CTE.
5	The Hazardous & Other Waste (Management and Transboundary Movement) Amendment Rules, 2016	Authorization required for storage, transportation, and disposal of the hazardous waste	To be obtained with Consolidated Consent and Authorization. Already obtained for existing plant.

1.7. TOR Compliance

The application for the scoping of the said project was submitted to the Expert Appraisal Committee (EAC) Industry III, MoEF&CC, New Delhi, and the Standard ToR was granted to the project vide No.J-11011/547/2010-IA.II(I) dated 15thFebruary,2022.

The EIA study is conducted in-line with the approved standard TOR accorded by EAC (Industry-I) and taking into consideration the structure of the report given in the Appendix III of EIA Notification 2006. The compliance to the approved TOR is presented in **Table 1.4**.

Table 1.4 : TOR Compliance

S.No.	Terms of Reference	Compliance
1	Executive summary	Provided before Chapter -1, Page 10 - 16
2	Introduction	
i.	Details of the EIA Consultant including NABET accreditation	Provided in Chapter 11
ii.	Information about the project proponent	Provided in section 1.3, Chapter-1 of EIA report
iii.	Importance and benefits of the project	Provided in Chapter-8 of EIA report
3	Project Description	
i.	Cost of project and time of completion.	Provided in section 1.5, Chapter-1 of EIA report
ii.	Products with capacities for the proposed project.	Provided in section 1.5,

S.No.	Terms of Reference	Compliance
		Chapter-1 of EIA report
iii.	If expansion project, details of existing products with capacities and whether adequate land is available for expansion, reference of earlier EC if any.	It is an expansion project. Existing product and capacity provided in Table 1.1, chapter 1 of report. Adequate land is available details provided in section 2.3.1, chapter 2 of EIA report
iv.	List of raw materials required and their source along with mode of transportation.	Provided in section 2.3.7, Chapter-2 of EIA report
v	Other chemicals and materials required with quantities and storage capacities	Not Applicable
vi	Details of Emission, effluents, hazardous waste generation and their management.	Provided in section 2.4.2, Chapter-2 of EIA report
vii	Requirement of water, power, with source of supply, status of approval, water balance diagram, man-power requirement (regular and contract)	Provided in section 2.3, Chapter-2 of EIA report
viii.	Process description along with major equipment's and machineries, process flow sheet (quantities) from raw material to products to be provided	Provided in section 2.4, Chapter-2 of EIA report
ix.	Hazard identification and details of proposed safety systems.	Provided in Chapter-6 of EIA report
x.	Expansion/modernization proposals:	
	a. Copy of all the Environmental Clearance(s) including Amendments thereto obtained for the project from MOEF/SEIAA shall be attached as an Annexure. A certified copy of the latest Monitoring Report of the Regional Office of the Ministry of Environment and Forests as per circular dated 30th May, 2012 on the status of compliance of conditions stipulated in all the existing environmental clearances including Amendments shall be provided. In addition, status of compliance of Consent to Operate for the ongoing existing operation of the project from SPCB shall be attached with the EIA-EMP report.	Environmental Clearance has been obtained from MoEF&CC, New Delhi vide their letter no. J-11011/547/2010-IA II (I) dated 23 rd June, 2011. Copy attached as Annexure-I Certified copy of latest Monitoring report attached as Annexure-I & II. Certified Compliance of Consent to operate for existing unit is attached as Annexure-

S.No.	Terms of Reference	Compliance
		II
	b. In case the existing project has not obtained environmental clearance, reasons for not taking EC under the provisions of the EIA Notification 1994 and/or EIA Notification 2006 shall be provided. Copies of Consent to Establish/No Objection Certificate and Consent to Operate (in case of units operating prior to EIA Notification 2006, CTE and CTO of FY 2005-2006) obtained from the SPCB shall be submitted. Further, compliance report to the conditions of consents from the SPCB shall be submitted.	Not Applicable
4	Site Details	
i.	Location of the project site covering village, Taluka/Tehsil, District and State, Justification for selecting the site, whether other sites were considered.	Provided in section 2.2, Chapter-2 of EIA report
ii.	A toposheet of the study area of radius of 10km and site location on 1:50,000/1:25,000 scale on an A3/A2 sheet. (including all eco-sensitive areas and environmentally sensitive places)	Provided in Figure 2.3, Chapter-2 of EIA report
iii.	Details w.r.t. option analysis for selection of site	Being an expansion unit and having land available no alternate site was considered.
iv.	Co-ordinates (lat-long) of all four corners of the site.	Provided in Figure 2.1, Chapter-2 of EIA report
v.	Google map-Earth downloaded of the project site.	Provided in Figure 2.4, Chapter-2 of EIA report
vi.	Layout maps indicating existing unit as well as proposed unit indicating storage area, plant area, greenbelt area, utilities etc. If located within an Industrial area/Estate/Complex, layout of Industrial Area indicating location of unit within the Industrial area/Estate.	Provided in Figure 2.6, Chapter-2 of EIA report
vii.	Photographs of the proposed and existing (if applicable) plant site. If existing, show photographs of plantation/greenbelt, in particular.	Provided in Figure 2.5, Chapter-2 of EIA report
viii.	Land use break-up of total land of the project site (identified and acquired), government/private - agricultural, forest, wasteland, water bodies, settlements, etc shall be included. (not required for industrial area)	The land is in possession of ACL Details provided in section 2.3,1 Chapter-2 of EIA report

S.No.	Terms of Reference	Compliance
ix.	A list of major industries with name and type within study area (10km radius) shall be incorporated. Land use details of the study area	Provided in section 3.3.3, Chapter-3 of EIA report
x.	Geological features and Geo-hydrological status of the study area shall be included.	Provided in section 3.5, Chapter-3 of EIA report
xi.	Details of Drainage of the project upto 5km radius of study area. If the site is within 1 km radius of any major river, peak and lean season river discharge as well as flood occurrence frequency based on peak rainfall data of the past 30 years. Details of Flood Level of the project site and maximum Flood Level of the river shall also be provided. (mega green field projects)	Provided in section 3.4, Chapter-3 of EIA report
xii.	Status of acquisition of land. If acquisition is not complete, stage of the acquisition process and expected time of complete possession of the land.	Land is already in Possession of ACL details given in section 2.3, Chapter 2 of EIA report
xiii.	R&R details in respect of land in line with state Government policy	No R&R is involved with project details provided in Section 9.11, chapter 9 of EIA report
5	Forest and wildlife related issues (if applicable):	
i.	Permission and approval for the use of forest land (forestry clearance), if any, and recommendations of the State Forest Department. (if applicable)	Not applicable
ii.	Landuse map based on High resolution satellite imagery (GPS) of the proposed site delineating the forestland (in case of projects involving forest land more than 40 ha)	Not applicable
iii.	Status of Application submitted for obtaining the stage I forestry clearance along with latest status shall be submitted.	Not applicable
iv.	The projects to be located within 10 km of the National Parks, Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild Animals, the project proponent shall submit the map duly authenticated by Chief Wildlife Warden showing these features vis-à-vis the project location and the recommendations or comments of the Chief Wildlife Warden-thereon	No National Parks, Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild Animals present within 10 km area hence not applicable

S.No.	Terms of Reference	Compliance
v.	Wildlife Conservation Plan duly authenticated by the Chief Wildlife Warden of the State Government for conservation of Schedule I fauna, if any exists in the study area	No Schedule-I and RET species present hence not applicable
vi.	Copy of application submitted for clearance under the Wildlife (Protection) Act, 1972, to the Standing Committee of the National Board for Wildlife	Not applicable
6	Environmental Status	
i.	Determination of atmospheric inversion level at the project site and site specific micro-meteorological data using temperature, relative humidity, hourly wind speed and direction and rainfall.	Provided in section 3.9.1, Chapter-3 of EIA report
	AAQ data (except monsoon) at 8 locations for PM10, PM2.5, SO2, NOX, CO and other parameters relevant to the project shall be collected. The monitoring stations shall be based CPCB guidelines and take into account the pre-dominant wind direction, population zone and sensitive receptors including reserved forests.	Provided in section 3.10, Chapter-3 of EIA report
ii	Raw data of all AAQ measurement for 12 weeks of all stations as per frequency given in the NAAQM Notification of Nov. 2009 along with – min., max., average and 98% values for each of the AAQ parameters from data of all AAQ stations should be provided as an annexure to the EIA Report.	Attached as Annexure-III
iii.	Surface water quality of nearby River (100m upstream and downstream of discharge point) and other surface drains at eight locations as per CPCB/MoEF&CC guidelines.	Provided in section 3.8, Chapter-3 of EIA report
iv	Whether the site falls near to polluted stretch of river identified by the CPCB/MoEF&CC, if yes give details.	Site does not fall near to polluted stretch of river identified by the CPCB/MoEF&CC
v	Ground water monitoring at minimum at 8 locations shall be included.	Provided in section 3.8, Chapter-3 of EIA report
vi	Noise levels monitoring at 8 locations within the study area.	Provided in section 3.11, Chapter-3 of EIA report
vii	Soil Characteristic as per CPCB guidelines.	Provided in section 3.7, Chapter-3 of EIA report
viii.	Traffic study of the area, type of vehicles, frequency of vehicles for transportation of materials, additional traffic due to proposed project, parking	Provided in section 4.6.6, Chapter-4 of EIA report

S.No.	Terms of Reference	Compliance
	arrangement etc.	
ix.	Detailed description of flora and fauna (terrestrial and aquatic) existing in the study area shall be given with special reference to rare, endemic and endangered species. If Schedule-I fauna are found within the study area, a Wildlife Conservation Plan shall be prepared and furnished.	Provided in section 3.12, Chapter-3 of EIA report
x	Socio-economic status of the study area.	Provided in section 3.13, Chapter-3 of EIA report
7	Environment Impact and Environment Management Plan	
i.	Assessment of ground level concentration of pollutants from the stack emission based on site-specific meteorological features. In case the project is located on a hilly terrain, the AQIP Modelling shall be done using inputs of the specific terrain characteristics for determining the potential impacts of the project on the AAQ. Cumulative impact of all sources of emissions (including transportation) on the AAQ of the area shall be assessed. Details of the model used and the input data used for modelling shall also be provided. The air quality contours shall be plotted on a location map showing the location of project site, habitation nearby, sensitive receptors, if any.	Provided in section 4.6.1, Chapter-4 of EIA report
ii.	Water Quality modelling – in case of discharge in water body	No water shall be discharged hence not applicable
iii.	Impact of the transport of the raw materials and end products on the surrounding environment shall be assessed and provided. In this regard, options for transport of raw materials and finished products and wastes (large quantities) by rail or rail-cum road transport or conveyor-cum-rail transport shall be examined.	Provided in section 4.6.6, Chapter-4 of EIA report
iv	A note on treatment of wastewater from different plant operations, extent recycled and reused for different purposes shall be included. Complete scheme of effluent treatment. Characteristics of untreated and treated effluent to meet the prescribed standards of discharge under E(P) Rules.	Provided in section 2.3.3, Chapter-2 of EIA report
v.	Details of stack emission and action plan for control of emissions to meet standards.	Provided in section 4.6.1, Chapter-4 of EIA

S.No.	Terms of Reference	Compliance
		report
vi.	Measures for fugitive emission control	Provided in section 4.6.1, Chapter-4 of EIA report
vii.	Details of hazardous waste generation and their storage, utilization and management. Copies of MOU regarding utilization of solid and hazardous waste in cement plant shall also be included. EMP shall include the concept of waste-minimization, recycle/reuse/recover techniques, Energy conservation, and natural resource conservation.	Provided in section 2.4.1, and 2.4.5 Chapter-2 of EIA report
viii.	Proper utilization of fly ash shall be ensured as per Fly Ash Notification, 2009. A detailed plan of action shall be provided.	Agreed and to be used as per norm in Cement making
ix.	Action plan for the green belt development plan in 33 % area i.e. land with not less than 2,500 trees per ha. Giving details of species, width of plantation, planning schedule etc. shall be included. The green belt shall be around the project boundary and a scheme for greening of the roads used for the project shall also be incorporated.	Provided in section 9.10, Chapter-9 of EIA report
x.	Action plan for rainwater harvesting measures at plant site shall be submitted to harvest rainwater from the roof tops and storm water drains to recharge the ground water and also to use for the various activities at the project site to conserve fresh water and reduce the water requirement from other sources.	Provided in section 9.14, Chapter-9 of EIA report
xi.	Total capital cost and recurring cost/annum for environmental pollution control measures shall be included.	Provided in section 9.16, Chapter-9 of EIA report
xii.	Action plan for post-project environmental monitoring shall be submitted.	Provided in Chapter-5 of EIA report
xiii.	Onsite and Offsite Disaster (natural and Man-made) Preparedness and Emergency Management Plan including Risk Assessment and damage control. Disaster management plan should be linked with District Disaster Management Plan.	Provided in Chapter-6 of EIA report
8	Occupational health	
i.	Plan and fund allocation to ensure the occupational health & safety of all contract and casual workers	Provided in section 9.9, Chapter-9 of EIA report
ii.	Details of exposure specific health status evaluation of worker. If the workers' health is being evaluated	Provided in section 9.9, Chapter-9 of EIA

S.No.	Terms of Reference	Compliance
	by pre designed format, chest x rays, Audiometry, Spirometry, Vision testing (Far & Near vision, colour vision and any other ocular defect) ECG, during pre placement and periodical examinations give the details of the same. Details regarding last month analyzed data of above mentioned parameters as per age, sex, duration of exposure and department wise.	report
iii.	Details of existing Occupational & Safety Hazards. What are the exposure levels of hazards and whether they are within Permissible Exposure level (PEL). If these are not within PEL, what measures the company has adopted to keep them within PEL so that health of the workers can be preserved,	Provided in section 9.9, Chapter-9 of EIA report
iv.	Annual report of health status of workers with special reference to Occupational Health and Safety	Provided in section 9.9, Chapter-9 of EIA report
9	Corporate Environment Policy	
i.	Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report.	Provided in section 9.6, Chapter-9 of EIA report
ii.	Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions? If so, it may be detailed in the EIA.	Provided in section 9.6, Chapter-9 of EIA report
iii.	What is the hierarchical system or administrative order of the company to deal with the environmental issues and for ensuring compliance with the environmental clearance conditions? Details of this system may be given.	Provided in section 9.4, Chapter-9 of EIA report
iv.	Does the company have system of reporting of non compliances / violations of environmental norms to the Board of Directors of the company and / or shareholders or stakeholders at large? This reporting mechanism shall be detailed in the EIA report	Provided in section 9.4, Chapter-9 of EIA report
10	Details regarding infrastructure facilities such as sanitation, fuel, restroom etc. to be provided to the labour force during construction as well as to the casual workers including truck drivers during operation phase.	Provided in section 9.7, Chapter-9 of EIA report
11	Enterprise Social Commitment (ESC)	

S.No.	Terms of Reference	Compliance
i.	Adequate funds (at least 2.5 % of the project cost) shall be earmarked towards the Enterprise Social Commitment based on Public Hearing issues and item-wise details along with time bound action plan shall be included. Socio-economic development activities need to be elaborated upon.	Provided in section 6.3, Chapter-6 of EIA report
12	Any litigation pending against the project and/or any direction/order passed by any Court of Law against the project, if so, details thereof shall also be included. Has the unit received any notice under the Section 5 of Environment (Protection) Act, 1986 or relevant Sections of Air and Water Acts? If so, details thereof and compliance/ATR to the notice(s) and present status of the case.	As per ACL No litigation pending
13	A tabular chart with index for points wise compliance of above TOR	Agreed and provided Table 1.4, Chapter1 of EIA report.
A	B. Specific Point	
1	Limestone and coal linkage documents along with the status of environmental clearance of limestone and coal mines	Not applicable
2	Quantum of production of coal and limestone from coal & limestone mines and the projects they cater to;	Not applicable
3	For large Cement Units, a 3-D view i.e. DEM (Digital Elevation Model) for the area in 10 km radius from the proposal site.	Not applicable
4	Present land use shall be prepared based on satellite imagery. High-resolution satellite image data having 1m-5m spatial resolution like quickbird, Ikonos, IRS P-6 pan sharpened etc. for the 10 Km radius area from proposed site. The same shall be used for land used/land-cover mapping of the area.	Provided in section 3.6, Chapter-3 of EIA report
5	If the raw materials used have trace elements, an environment management plan shall also be included.	Not applicable
6	Plan for the implementation of the recommendations made for the cement plants in the CREP guidelines must be prepared.	Provided in section 9.15, Chapter-9 of EIA report
7	Energy consumption per ton of clinker and cement	Energy consumption

S.No.	Terms of Reference	Compliance
	grinding	per ton of cement grinding is estimated to be 37 kWh/MT of the Product
8	Provision of waste heat recovery boiler	Not Considered
9	Arrangement for use of hazardous waste	Small quantity of Used or Spent oil will be generated as per Schedule-I of Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016; which is will be sold to CPCB authorized recycler.

1.8. Structure of the Report

This EIA report has been prepared based on available on-site primary data (survey/monitoring) and secondary/literature data. The EIA report contains project features, baseline environmental setup, assessment of environmental impacts, and formulation of mitigation measures, environmental management, and monitoring plan with risk & disaster management plan. The report would include 10 Chapters and the structure of the EIA Report with necessary tables, drawings and annexure is as follows:

Chapter 1: Introduction

This chapter provides background information on need of project, need of EIA study and brief of the project. The scope and EIA methodology adopted in preparation of EIA report have also been described in this Chapter. It also covers the identification of project & project proponent, brief description of nature, size, location of the project and its importance to the country and the region. Scope of the study details about the regulatory scoping carried out as per the generic structure given in the EIA Notification, 2006.

Chapter 2: Project Description

This chapter deals with the project details of the existing unit and the proposed expansion of ACL Complex, with type of expansion in project, need for the expansion at the project site, location, size & magnitude of operation including associated activities required by and for the expansion project, proposed schedule

for approval and implementation, including technical details of raw material, quality and quantity etc.

Chapter 3: Description of the Environment

This chapter presents the existing environmental status of the study area around the existing unit and the proposed expansion project including topography, drainage pattern, water environment, geological, climate, transport system, land use, flora & fauna, socio-economic aspects, basic amenities etc. Environmental assessment of the proposed expansion project site considering the already established existing unit regarding its capability to receive the proposed new development is also discussed in this Chapter.

Chapter 4: Anticipated Environmental Impacts and Mitigation Measures

This chapter describes the overall impacts of the existing and proposed expansion project activities and underscores the areas of concern, which need mitigation measures and describing the already implemented mitigation measures at the existing unit for respective environment concerns. It predicts the overall impact proposed expansion project on different components of the environment viz. air, water, land, noise, biological, and socio-economic.

Chapter-5: Environment Monitoring Programme

Technical aspects of monitoring the effectiveness of mitigation measures which are already set for the existing unit and updated as per the need of expansion proposed at the site (incl. Measurement methodologies, frequency, location, data analysis, reporting schedules, emergency procedures, detailed budget & procurement schedules).

Chapter 6: Additional Studies

This chapter deals with the potential risk assessment carried out for the proposed expansion at ACL Complex during construction and operation due to bulk storages of Hazardous materials and sample disaster management plan

Chapter 7: Project Benefits

This chapter presents the details of direct and indirect benefits due to proposed expansion project.

Chapter 8: Environmental Management Plan

This chapter details the inferences drawn from the environmental impact assessment exercise and the EMP already developed for the existing unit to strengthen the mitigation measures for expansion project. It describes the overall impacts of the proposed activities during construction and operation phases and underscores the areas of concern, which need mitigation measures. It also provides mitigation and control measures for environmental management plan (EMP) for minimizing the

negative environmental impacts and to strengthen the positive environmental impacts of the proposed project.

Chapter 9: Summary & Conclusion

This chapter provides the summary and conclusions of the EIA study of the proposed expansion project with overall justification for implementation of the project and explanation of how, adverse effects will be mitigated.

Chapter 10: Disclosure of Consultants Engaged

This chapter provides the brief resume of the consultants engaged and the team engaged to carry out the EIA study.

Chapter 2. PROJECT DESCRIPTION

This chapter deals with the project details of the existing & proposed cement manufacturing plant, project location, size & magnitude of operation including associated activities required by and for the project, proposed schedule for approval and implementation, including technical details of raw material, quality and quantity etc.

2.1. Type of Project

M/s. Ambuja Cements Limited (Unit: Sankrail) has proposed for Expansion in Cement Production Capacity (2.4 MTPA to 4.0 MTPA) of Existing Stand-alone Grinding Unit at Village: Jala Dhulagori, Tehsil: Sankrail, District: Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail). The cost of the project is estimated to be Rs. 400 Cr.

The proposed project is Cement Grinding Unit. Cement Production capacity is from 2.4 MTPA to 4.0 MTPA. Clinker will be sourced from Sister Units of M/s. Ambuja Cements Limited (ACL- Bhatapara unit). Clinker will be grinded in Cement Mill and mixed with flyash and gypsum to produce various grade cement. Provision has been kept in the CGU to mix blast furnace slag and make Slag Based Cement. The cement will be bagged and sold. The project is independent project and not interlinked.

2.2. Site Location and Surrounding

Proposed plant site is located at Village: Jala Dhulagori, Tehsil: Sankrail, District: Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail). The site is well connected to NH - 6 (~0.2 km in NW direction) and NH - 117 (~7.5 km in ENE direction). Nearest town is Andul (~5.5 km in ENE direction). Nearest Railway Station is Sankrail Railway Station (~1.5 km in ESE direction). Nearest Airport from plant site is Kolkata Airport (~26.5 km in NE direction).

The site is well connected with communication facilities like telephone, wireless and as such, no constraints are envisaged in this aspect as the tehsil and district headquarters are near to the site. Critically polluted area i.e. Jalan Industrial complex is located close to the proposed site. Being an existing unit as well as land is available with ACL no alternate site was considered. Close view map of the site showing corner coordinate are presented in **Figure 2.1**. Location Map of the site is presented in **Figure 2.2**. Topo map and Google map of the study area is presented in **Figure 2.3& Figure 2.4** respectively. Photographs of the existing plant and proposed expansion area is presented in **Figure 2.5**.

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

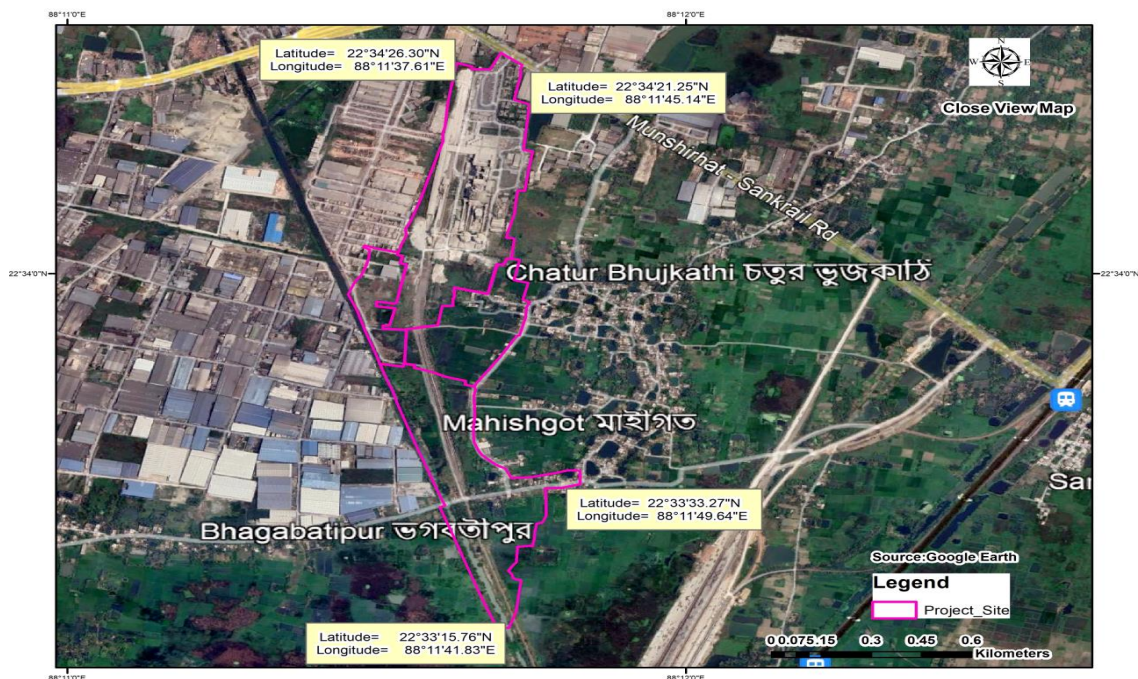


Figure 2.1 : Project Boundary Map

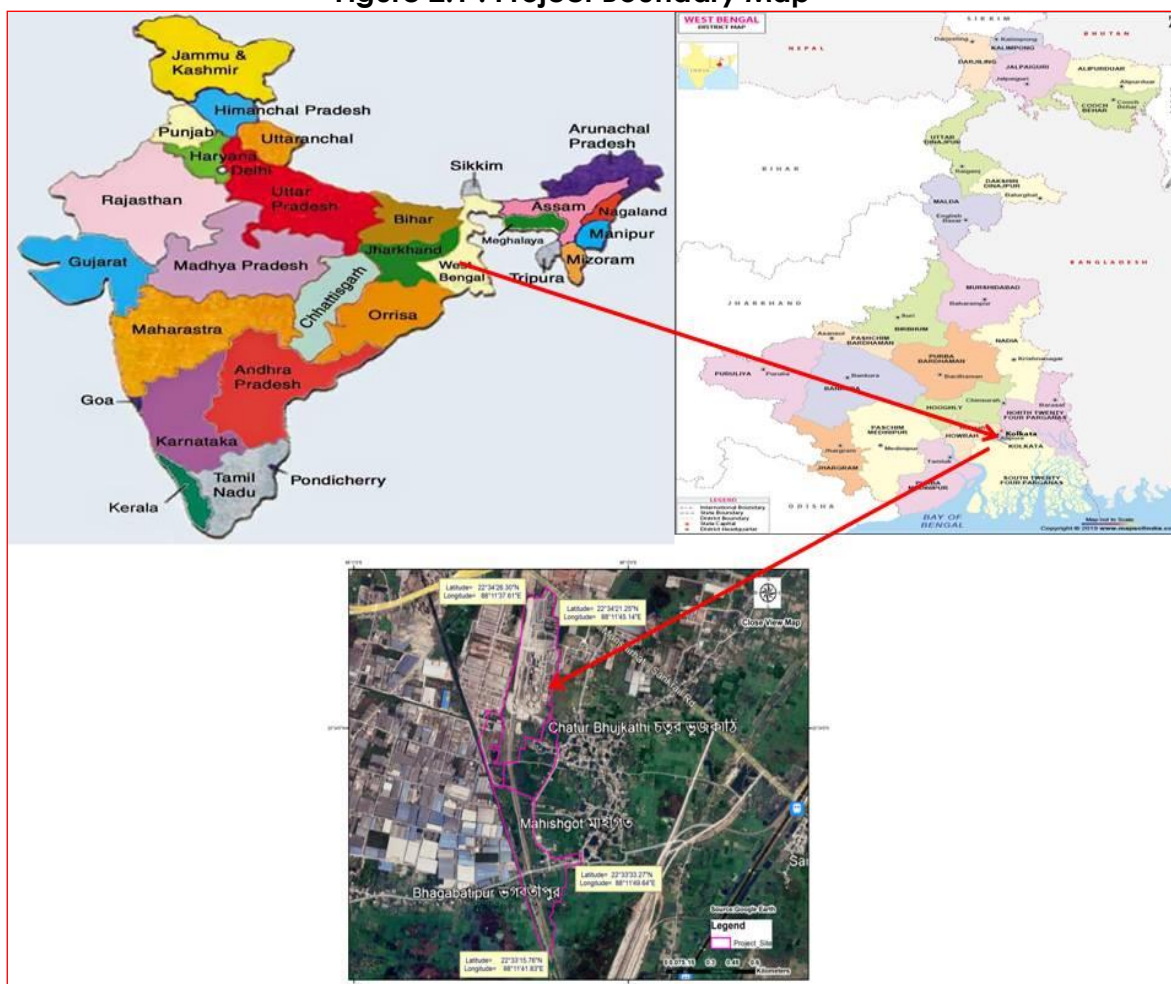


Figure 2.2 : Project Location Map

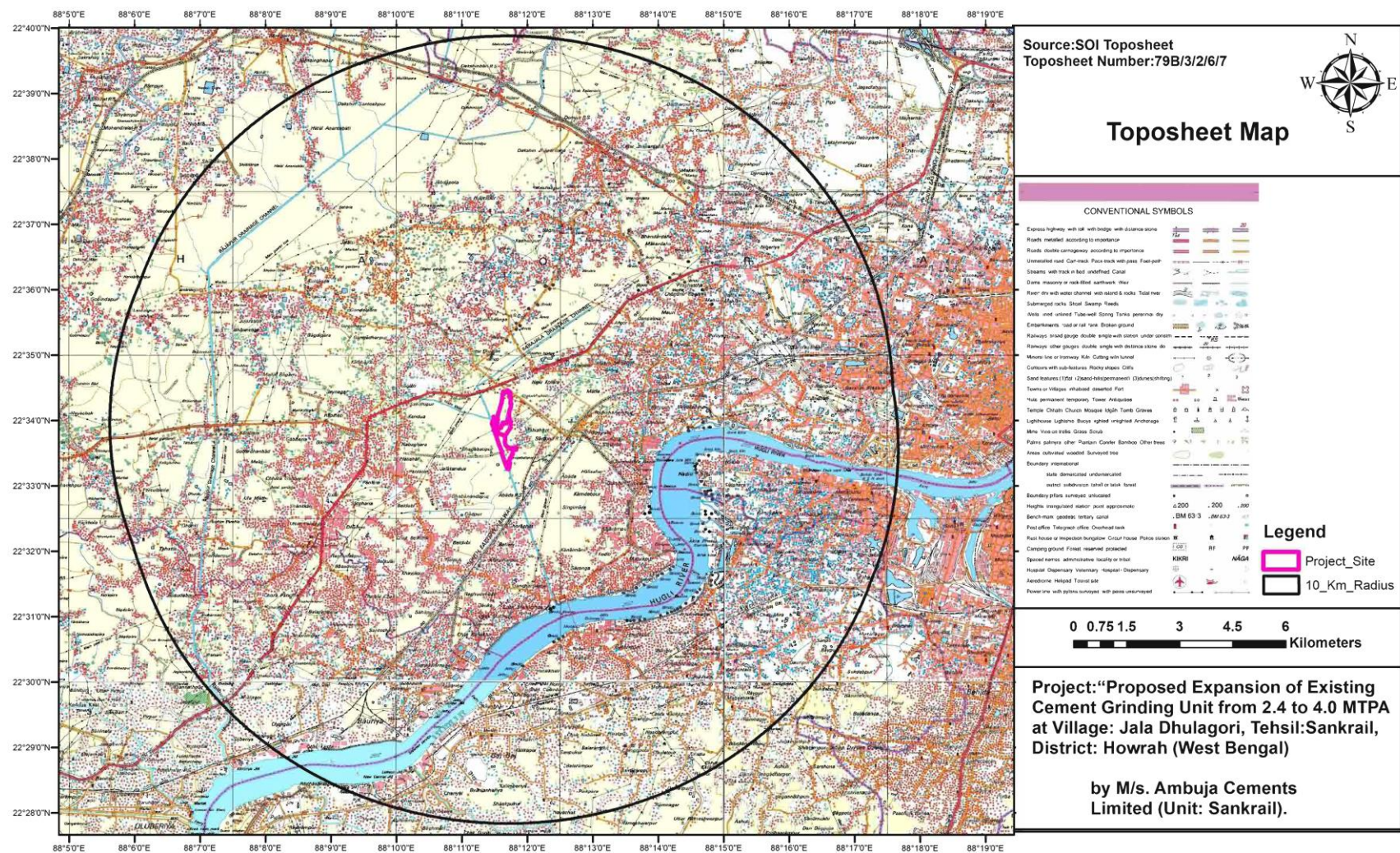


Figure 2.3 : Topo Map of the Project Site and surrounding 10 km area

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

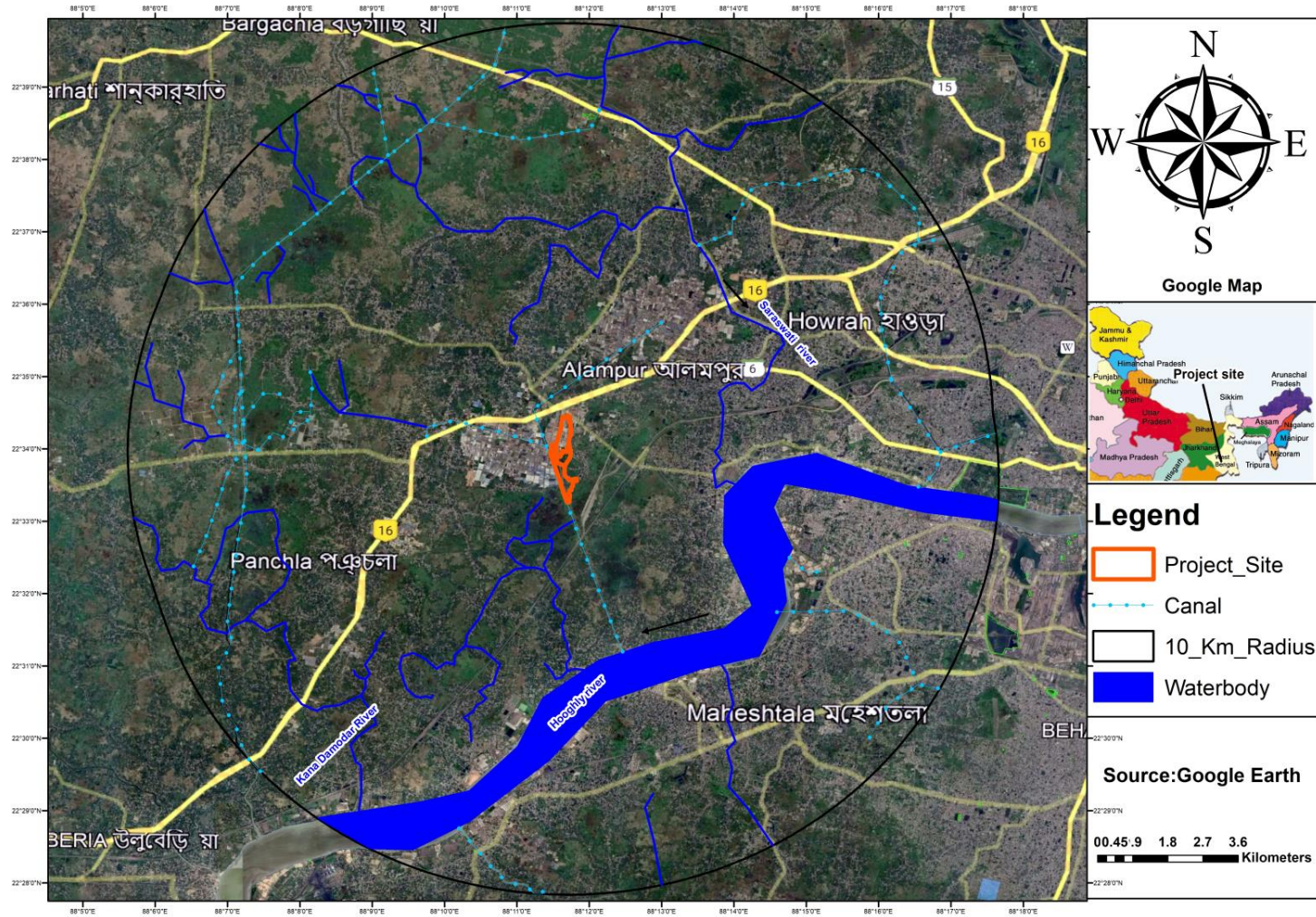


Figure 2.4 : Google Map showing the project site and surrounding 10 km area



Existing Unit of ACL



Figure 2.5 : Photographs of Existing Plant and proposed expansion are

2.3. Infrastructure Requirement

2.3.1. Land Requirement

The proposed expansion in cement production capacity will be done within the existing plant premises & additional land available with the Ambuja Cement Limited (ACL). Total area available with the ACL at Sankrail unit is 32.64 ha. Out of the total area existing Plant is located in 18.36ha. Rest of the 14.28 ha has been proposed for said expansion. ACL has already developed a greenbelt in 4.86 ha area in existing unit. Further in proposed expansion ACL proposed to develop additional greenbelt to achieve total greenbelt in 5.91 ha area. After expansion the total green area will be 10.77 ha (33% of the total project area). At present the land use of 14.28 ha land (proposed for expansion) is agricultural which shall be converted into industrial. The plant area break- up is given in **Table 2.1**.

Table 2.1 : Plant Area Break-Up

Sl. No.	Unit	Area (Ha)		
		Existing	Additional	Total after expansion
1	Plant & Machinery	9.19	2.81	12.00
2	Rail, Road, Infrastructure incl. open area	4.31	5.56	9.87
3	Green Belt	4.86	5.91	10.77
	Total Plant Area	18.36	14.28	32.64

Source: ACL

2.3.2. Project Lay Out

The layout map showing existing and proposed plant area is presented in **Figure 2.5**.

2.3.3. Water Requirement

The water consumption for grinding unit will be low as the requirements are only for cooling system and the water will be re-circulated in a closed system. Only make up water will be required for meeting the evaporation losses in the cooling circuit. The source of water would be from the ground water. Water for drinking and domestic purposes will be needed additionally. Fresh Water requirement for existing grinding unit is about 180 KLD. For proposed expansion about 90 KLD fresh water and 40 KLD recycled water shall be required. After expansion total freshwater requirement will be 270 KLD. The detail water requirement is presented in **Table 2.2**.

Table 2.2 : Water Requirement

Water use area	Water Requirement						
	Existing Unit		Proposed Expansion		Total expansion After		Source
	Recycled water	Fresh water	Recycled water	Fresh water	Recycled water	Fresh water	
Grinding Unit (cooling)	-	20	-	60	-	80	
Domestic uses	-	160	-	30	-	190	
Greenbelt	10	-	30		30		
Other		-	10		20		
Total	10	180	40	90	50	270	Fresh water: Borewell Recycled water: RO,IR&softener reject, RWH,treated water from STP, cooling reject

Source: ACL

Wastewater Generation: cement making is a dry process wastewater shall be generated from domestic only. After expansion total 160 KLD wastewater shall be generated and treated in STP.

Water uses	Water uses in existing unit	Waste water generation in existing unit	Water uses in Proposed expansion	Waste water generation in Proposed Expansion	Total waste water generation
Grinding Unit (cooling)	20 (fresh water)	Nil	60 (fresh)	Nil	Nil
Domestic uses	160 (fresh water)	128	30 (fresh)	32	160
Greenbelt	10	Nil (100%)	40	Nil (100%)	Nil

& other	(recycled)	evaporated)	(recycled)	evaporated)	
---------	------------	-------------	------------	-------------	--

Water Source & Permission status: Water requirement of existing as well as proposed expansion unit shall be sourced from ground water. ACL has already obtained Permission for ground water withdrawal (270 KLD) from West Bengal Ground Water Resources for the existing as well as proposed expansion unit (copy of the permission is attached as **Annexure-IV**).

2.3.4. Power Requirement

Power requirement for existing unit is 13 MW. Power requirement for the proposed project is estimated be 12 MW. Total power requirement after expansion will be 25 MW. Power will be sourced from West Bengal Power Development Corporation (WBPDCL). Existing D.G. Set (22380 KVA) will be used for back-up in proposed expansion also.

2.3.5. Fuel Requirement

Fuel Required for the proposed project is summerised in Table below:

Table 2.3 : Fuel Requirement

Name	Quantity (KL D)	Calorific value (Kcal. /kg)	%Ash	% S	Distance & Mode of Transportation
LDO/HSD	42	11399	0.01	1.2%	By road

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

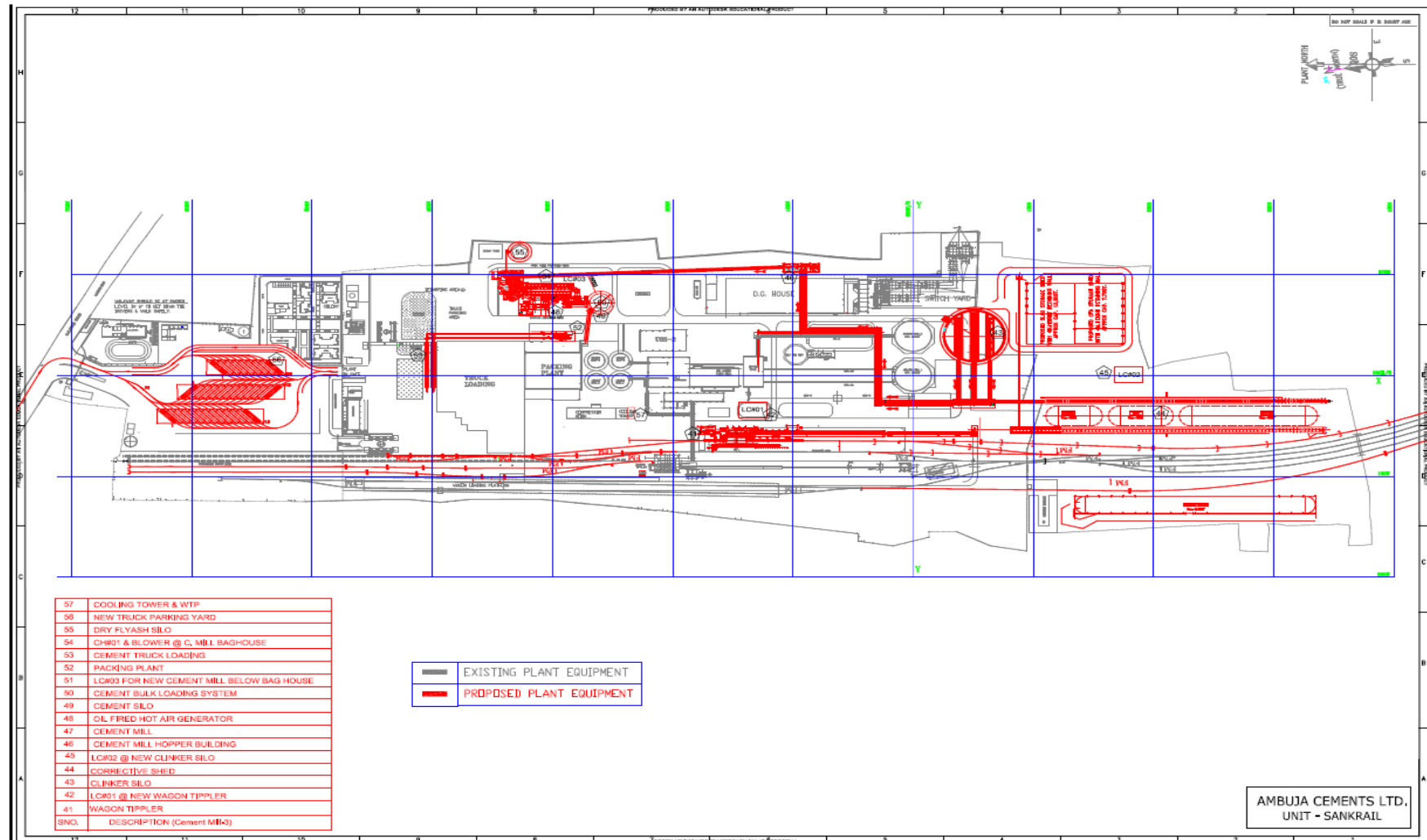


Figure 2.6 : Plant Layout

2.3.6. Manpower Requirement

Existing Plant: Permanent 82 and contractual labour 405

Proposed Expansion project:

During Construction: Permanent 82 and contractual labour 1000 (approx)

During operation: Additional 20 permanent and 120 Contractual labour.

2.3.7. Raw Material Requirement

Details of raw materials is given in **Table 2.4**. These quantities are likely to vary in some narrow range as per the variation in quality of inputs i.e. fly ash, slag, gypsum etc and type of cement produced as per market demand.

Table 2.4 : Raw Material Requirement, Source & Transportation

Name of Raw Material	Existing Unit (MTPA) dry basis (2.4 MTPA)	Proposed Expansion (MTPA) dry basis (1.6 MTPA)	Total After Expansion (MTPA) dry basis (4.0 MTPA)	Source	Distance & Mode of Transportation
Clinker	1.464	0.68	2.144	ACL, Bhatapara	Max. distance 850 Km Transport by Rail and Road
Fly ash (DFA/CFA)	0.828	0.48	1.308	Kolaghat, Haldia, Durgapur & Badge Budge, Mythan	Max. distance 450 km, Transport by Rail
Gypsum	0.108	0.072	0.18	Paradeep & Haldia	Max. distance 450 km, Transport by Rail
Slag	-	0.368	0.368	Durgapur & Kharagpur	Max. distance 170 Km, Transport by Truck (Road)

Source: ACL

Stockpiles: Fly ash shall be directly unloaded in silos. Clinker will be unloaded in silos / clinker dome whose base will be concrete. Slag and Gypsum will be kept in shed having concrete base and fully covered.

2.4. Process Description

The process selected for the grinding system is the state-of-the-art modern Vertical roller Mill. This technology is most energy efficient technology for the production of Cement compared to conventional technology, energy saving of 20% is achieved compared to conventional technology. The other features of this project are:

- Addition of steel plant slag / Power plant fly ash in cement adds value to the waste generated from the blast furnace slag and power plant ash; an environment unfriendly waste.
- The plant would incorporate the latest microprocessor based DCS system
- Cooling water circuit is close circuited, no generation of wastewater
- The process selected envisages recycling all the dust collected in the air pollution control equipment, ensuring no generation of solid waste.

2.4.1. Selection of Main Machinery and Storage

The technical basis for selecting the plant and equipment is given below:

- High operational safety and reliability and thus high availability of the plant and machinery even under adverse conditions;
- Ease of operation and maintenance;
- Ease of logistics of raw material supplies and product dispatch
- Ease of organizational aspects (high automation; optimum manpower)
- Energy savings.

Based on the above, a cost effective, most modern state-of-the-art and energy efficient machinery have been envisaged. The following systems / equipment are included in the project with necessary sub-systems for pollution control for each major system. The cement grinding unit will use the blast furnace slag to produce Cement. Clinker will be sourced from Sister Units of M/s. Ambuja Cements Limited. (Unit: Integrated Cement Plant ACL Works-Chhattisgarh). The clinker will be grounded along with flyash ,gypsum and granulated slag in defined proportions in Cement Mill (clinker 42.5 %+ FA 30%+Gypsum 4.5%+ 23% slag). Clinker will be stored in clinker storage tank.

2.4.2. Plant Facilities Proposed

The major facilities and associated activities proposed as a part of proposed project are as givenbelow –

Table 2.5 : Proposed Plant Facilities

Sl. No	Unit	Proposed major Facilities
1	Grinding Unit	<ul style="list-style-type: none"> ➤ VRM (1 no.) with feeding system ➤ Wagon Tippler with unloading system ➤ Packers (1 no.) ➤ Stacker & Reclaimer ➤ Storage facilities: Clinker Silo (1), Cement Silo(1), Fly ash Silo (1), RM Storage hoppers, and Covered Sheds ➤ Raw material Conveying system

		(belt conveyors) ➤ Additional railway line at wagon tippler/ packing plant ➤ Cement bags loading machine for trucks (2 nos.) ➤ Slag and fly ash dryer (with HAG)
--	--	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------

2.4.3. Material Processing & Storage

Clinker Storage and Handling: Clinker will be received at plant site by road & railway. Clinker will be received at the site will be unloaded and transported by a belt conveyor to the clinker silo. From the silo, clinker will be conveyed to the mill hopper by a combination of extraction equipment and belt conveyors. Clinker will be sourced from own and other clinker units. A railway siding is provided at plantsite for transportation of raw materials and product.

Fly Ash Storage & Handling: Fly ash from different sources is being transported through closed bulkers and rake (with 12-14% moisture). Fly ash from bulkers is fed into silo/Cement mill through pneumatic conveying system whereas rakes are unloaded through wagon tippler & poclain and shifted to storage shed. From silo to Cement Mill fly ash is conveyed through a complete extraction system and from storage shed it is transferred to storage hopper through conveyor belt and then fed to Cement mill.

Gypsum Storage & Handling: Gypsum is received through rake and unloaded at site through wagon tippler or Poclain as it contains around 15-25% moisture. From the unloading site it is transferred to a storage shed by using Proclaim and dumper. Then the gypsum is conveyed to the storage hoppers through feeding hopper and conveyor belts. From storage hoppers it is being fed to the Mill. Sometimes Gypsum will be received by road and also through trucks and will be unloaded by truck tippler and transported to storage yard by a belt conveyor. Gypsum will be reclaimed by reclaimer /pay loader / dozer and fed to hopper for further conveying to Mill hoppers. Indian, imported, chemical and synthetic gypsum will be utilized.

Slag storage & handling: Slag is received through rake and unloaded at site through wagon tippler. From unloading site, it is transferred to storage shed by using wagon tippler & Poclain and dumper. Then the slag is conveyed to the storage hoppers through feeding hopper and conveyor belts. From storage hoppers it is being fed to Cement Mill. Slag is received also by road through trucks and unloaded by truck tippler and transported to storage yard by a belt conveyor. Slag will be reclaimed by reclaimer for further conveying to Mill hoppers by conveyors.

2.4.4. Cement Manufacturing & Storage

The cement manufacturing will be based on dry process technology with closed circuit grinding unit and automated rotary packers and truck loading machines for packing & loading of cement. The cement manufacturing is based on Rollerpress+ ball mill(existing) / Vertical Roller Mill(proposed)/Ball mill(existing) grinding technology. Cement will be packed using electronic rotary packers and will be loaded in the trucks with the help of truck loading machines. The cement manufacturing process largely comprises of the following units:

Name of Units	Capacity	Environmental Issue
Clinker Grinding Mill	260 TPH	Dust and Noise
Cement Packing,	240 TPH	Dust and Noise

Cement grinding System: For PCC Production Clinker, Slag, Conditioned fly ash/ Dry fly ash and Gypsum is grounded in Vertical Roller mill. A high efficiency separator is mounted at the VRM which classifies the material. For PPC Clinker, fly ash and gypsum are grounded in Roller press +Ball mill(existing) / VRM(proposed) and stored in Cement silo after classification in separator. Process flow of cement manufacturing is presented in **Figure 2.5**.

The fine/grounded cement (final product) is conveyed through air slides and elevator to the cement silo.

Cement Storage: Cement from the cementgrinding section will be transported to the storage silo by a system of air slides and bucket elevator. From the silos, cement shall be transported to the packer with the help of a set of air slides and bucket elevators.

Cement Packing, Loading & Dispatch: From silos PPC & PCC would be extracted and packed in HDPE bags of 50 kg weight by rotary type electronic packer and stored in a go down or loaded on to the trucks or wagons with the help of Semi automatic /automatic truck loaders or wagon loaders. In line with the most modern technical concept of the plant which favorably compares with the best technology in the world, the electronic packing machine shall be with microprocessor based fully automatic operation and shall ensure minimum weight variations from bag to bag, as is the case with the existing packing machine. Material balance assuming 330 operating days for PPC and slag-based cement making is presented in **Table 2.6**.

Table 2.6 : Material Balance of Cement Grinding Unit (4840 MT/Day)

--	--	--	--	--

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

Type of Cement	Input	Quantity (Tons/ day)	Output	Quantity (Tons/Day)
Cement Making (PPC)	Clinker	2952 (61%)		
	Gypsum	218 (4.5%)	Cement	4840
	Fly ash	1670 (34.5%)		
Composit Cement	Clinker	2057 (42.50%)		
	Gypsum	218 (4.5%)	Cement	4840
	Fly ash	1452 (30%)		
	Slag	1113 (23%)		

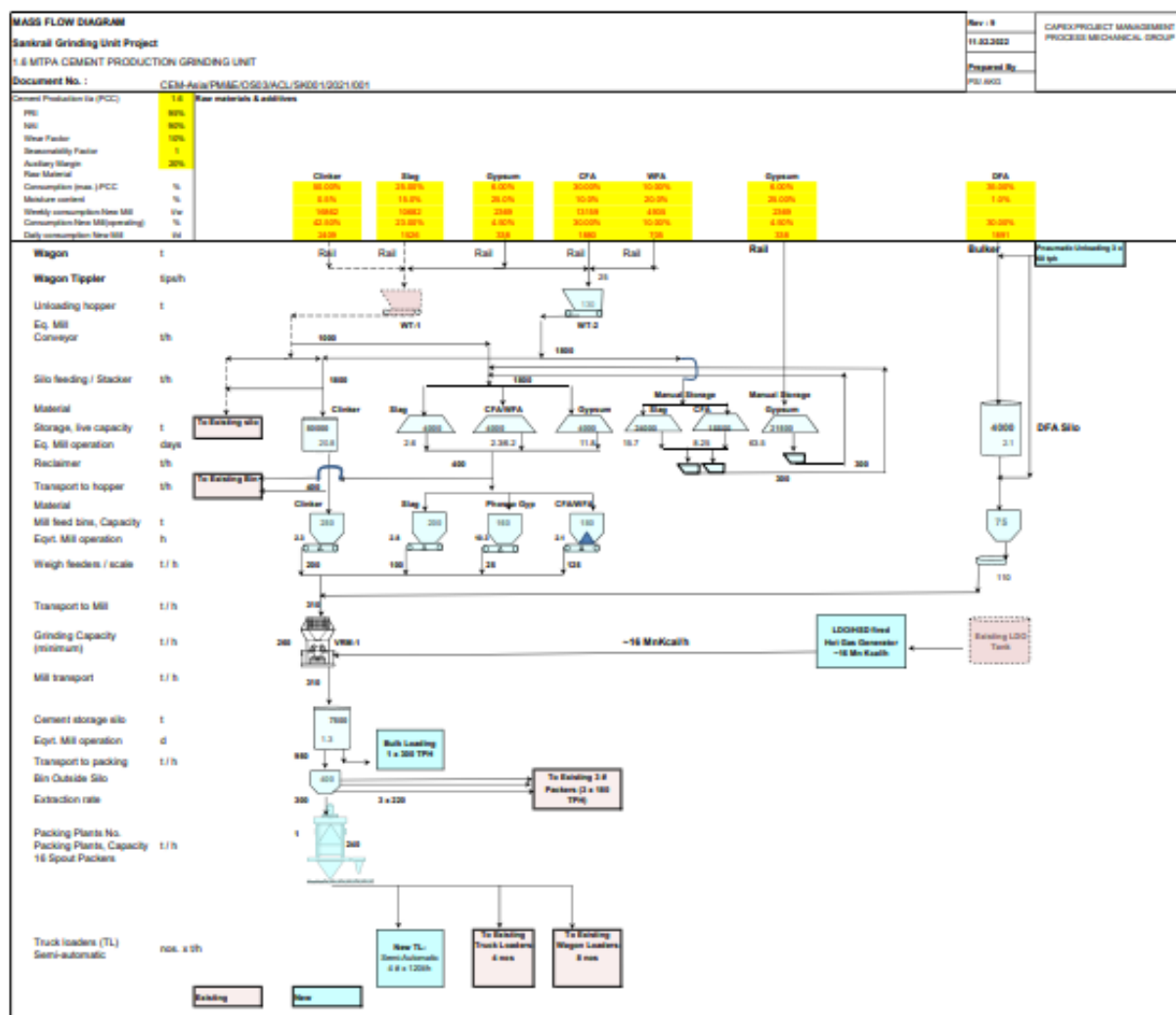


Figure 2.7 : Process Flow Sheet (Cement Manufacturing)

2.4.5. Pollution Mitigation Measures

There are several points of fugitive dust (Particulate Matter-PM) generation in a Cement Grinding Unit. In the proposed plant, all points, howsoever minor or insignificant it may be, has been provided with air pollution control system. The details of the fugitive dust generation points and air pollution control system is given below:

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

Table 2.7 : Details of the fugitive dust generation points and air pollution control system (Existing Unit)

S. No.	Attached with	Capacity, -m ³ /Hr	Temp. °C	Fan flow - m ³ /Hr	Fan Kw	No. of Bag house	Fabric Type	Size of bags dia x length mm	Stack ht from GL, m	Stack dia. m	Inlet Dust Concentration	
											Inlet PM load g/m ³	Outlet PM emission mg/Nm ³
1	Packer-1	20000	70	22000	45	2	polyster	149x3650	30	1	100	< 30 mg
2	Packer-2	20000	70	22000	45	2	polyster	149x3650	30	1	100	< 30 mg
3	Packer-3	36000	48-50	41400	55	1	polyster	150x3660	36.5	1.1	100	< 30 mg
4	Packer-4	36000	48-50	41400	55	1	polyster	150x3660	36.5	1.1	100	< 30 mg
5	Cement Mill-2 hopper	16000	50	17600	30	1	polyster	149x3650	30	0.6	100	< 30 mg
6	Cement Mill-2 Vent	23000	88	30900	75	1	polyster	149x3650	32	1.05	100	< 30 mg
7	Cement mill-2 osepa	47000	50	52000	55	1	polyster	149x3650	32	1.05	100	< 30 mg
8	cement Mill-1 Vent	23000	50	30900	75	1	polyster	149x3650	32	1.05	100	< 30 mg
9	Cement Mill-1 hopper	16000	35	17600	30	1	polyster	149x3650	30	0.6	100	< 30 mg
10	Rollerpress	34500	60-80	39675	75	2	polyster	149x4565	71.5	1.5	100	< 30 mg
11	Wagon tippler	167000	50	183000	200	1	polyster	150x3660	28	2.1	100	< 30 mg
12	DG-1								60	1.0	100	< 50 mg
13	DG-2								60	1.0	100	< 50 mg
14	DG-3								60	1.0	100	< 50 mg

Table 2.8 : Details of the fugitive dust generation points and air pollution control system (Proposed Expansion)

S. No.	Attached with	No	Capacity, -m ³ /Hr	Temp. °C	Fan flow - m ³ /Hr	Fan Kw	No. of Bag house	Fabric Type	Size of bags dia x length mm	Stack ht from GL, m	Stack dia. mm	Inlet Dust Concentration	
												Inlet PM load g/m ³	Outlet PM emission mg/Nm ³
1	Wagon Tippler	1	200000	60	230000	~400	1	Mixed felt	149x 4260	~30	~3300 (bottom)/ 2000(at top)	50	< 30
2	Cement Mill vent	1	680000	90-100	710000	~2240	1	PAN	149 x 8000	~44	~2800	~600	< 30
3	Packing Plant	1	28000	70-80	32200	~45	1	Polyster Needle Felt	150 x 3600	~30	~1000	50	< 30

Note: The point source emission; namely Cement Mill will be provided with high efficiency Bag House.

2.4.5.1. Noise Pollution Control

The mills, crushers, screens, DG set, conveyor belts, pumps, fans, air compressors are the main sources of noise generation in the proposed CGU. The mills, crushers and screens shall be provided with covered shed to suppress the noise level. DG set room shall be acoustically treated. DG sets meeting the standard insertion loss / norms to meet noise standard shall be procured from the manufacturer. Type approval certificate shall be obtained from the manufacturer. Pumps, fans and air compressors shall be kept inside room, provided with acoustic treatment and solid foundation to minimize the vibration and noise.

2.4.5.2 Water Pollution Control

Wastewater Generation: Domestic wastewater generated from plant and colony will be treated in STP of 200 KLD capacity and treated water will be used for greenbelt development / plantation.



Photograph of existing STP

Effluent Treatment Scheme: The effluent generated from domestic uses shall be treated in STP consisting of primary, secondary and tertiary treatment describes below:

Primary treatment: the raw waste will first flow through the bar screen chamber and oil grease trap for reduction of floating particles, leaves, twigs or free-floating oil etc. and will collect in an equalization tank for proper mixing of waste and flow homogenization. From this sump the waste will be pumped for secondary treatment system for biological reduction.

Secondary Treatment: this system will consist of one number of FAB (Fluidized Aerobic Bioreactor) tank followed by secondary settling tank. Special type of bacteria culture will be developed inside the FAB tank for reduction of BOD and COD. In FAB tank air will be provided by air blower for aeration and mixing inside the tank. In this tank special bacteria culture will be added for formation of microorganism. From this tank the wastewater will flow to tube settler unit for settlement of suspended solids before being collected into filter feed tank. Sludge settled inside the Tube Settler Unit will be recycled back to FAB tank for maintaining the level of microorganism. Excess sludge will be sent to sludge drying bed.

Tertiary Treatment: From Filter feed tank water will be pumped through the pressure pump filter (remove suspended particles) followed by an activated carbon filter for reduction of trace solids and odour, then collected in a treated water along with disinfection system. From their clear water will be pumped for distribution.

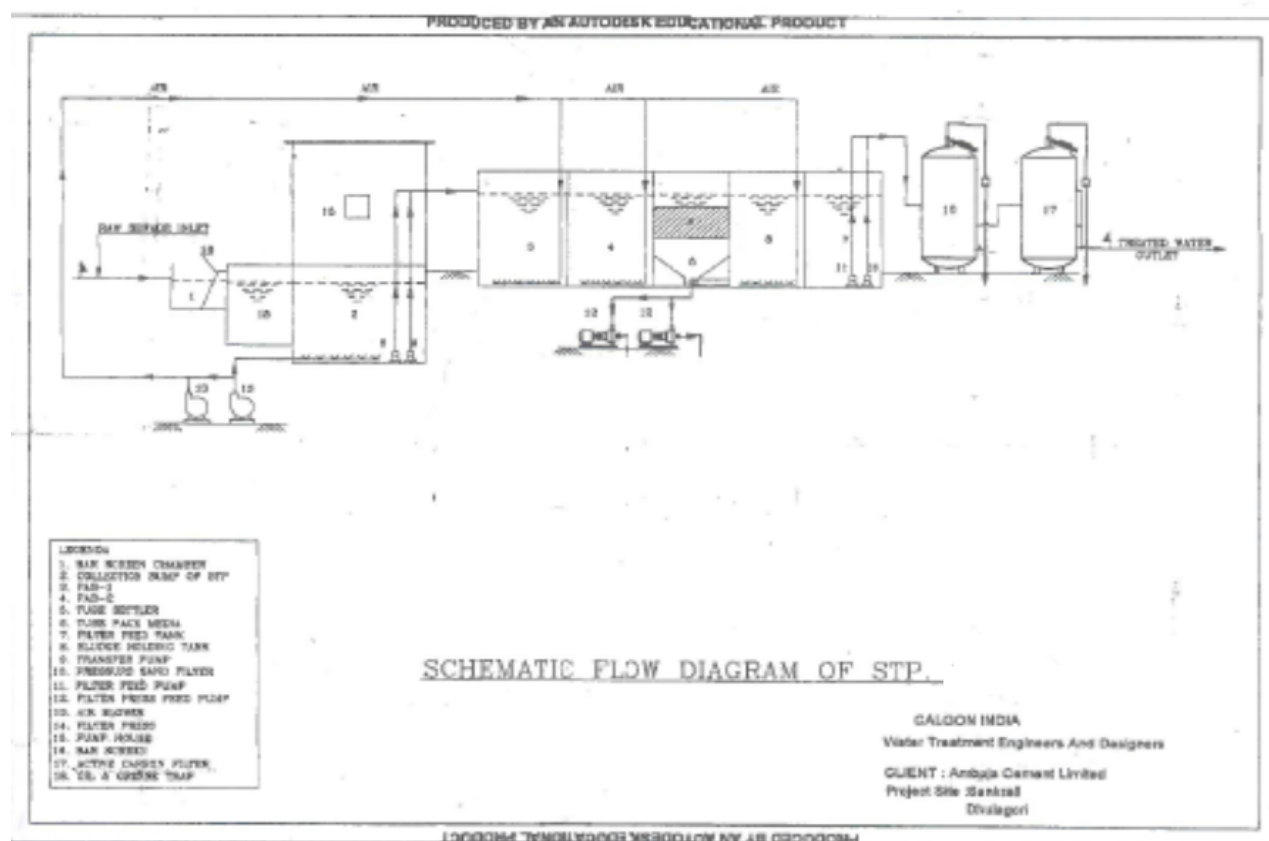


Figure 2.8 : Schematic Flow Diagram of STP

2.4.5.3. Solid & Hazardous Waste Management

Dust collected from various pollution control equipment's (Bag filters) will be recycled into the process. Sewsage sludge generated from STP will be used as manure in greenbelt development plantation. Construction waste generated due to proposed expansion project like soil, brick bits will be utilized in levelling of land and construction

of road inside the project area. Municipal Solid waste generated from plant canteen & colony will be collected, segregated and disposed off scientifically in compliance of Solid Waste Management Rules, 2016. Used Lead acid batteries will be stored in the designated storage area and will be sold to registered vendors as per Battery waste

Small quantity of Used or Spent oil will be generated and as per Schedule I of Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016; which will be sold to CPCB authorized recycler.

2.4.6. Energy Saving Measures

Power savings methods are adopted as per energy conservation:

- Temperature sensors with visible temperature indicators in the switch boards
- Check metering at various locations to check the power consumption and power loss if any.
- Suitable rating and size cables selection to limit the total power distribution losses less than 1%
- Solar water heater for pre – heating water required for bathing and cooking.
- Use of high efficiency hybrid chillers (water and air cooled) and variable speed drivers.
- Use of solar lights in plant area.

Chapter 3. DESCRIPTION OF THE ENVIRONMENT

This Chapter describes the baseline environmental conditions around the ACL project site for various environmental attributes, i.e., physical, biological, and socio-economic conditions, within the 10-km radial zone of the proposed project site, which is termed as the study area. Topography, drainage, meteorology, air, noise, water, soil, and land constitute the physical environment, where as flora and fauna constitute the biological environment. Demographic details and occupational pattern in the study area constitute socio-economic environment.

3.1. Introduction

This chapter illustrates the description of the existing environmental status of the study area with reference to the prominent environmental attributes. As a precursor for the prediction of various types of environmental impacts likely to arise due to implementation of this project, it is essential to establish the base line environmental status.

The existing environmental setting is considered to adjudge the baseline environmental conditions, which are described with respect to physico-chemical, biological, and socio-economic parameters in the project area and within the project influence area. The objective of this section is to define the present environmental status which would help in assessing the environmental impacts due to the proposed project.

3.2. Background and Salient Environmental Features of the Study Area

Proposed plant site is located at Village: Jala Dhulagori, Tehsil: Sankrail, District: Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail). The site is well connected to NH - 6 (~0.2 km in NW direction) and NH - 117 (~7.5 km in ENE direction). Nearest town is Andul (~5.5 km in ENE direction). Nearest Railway Station is Sankrail Railway Station (~1.5 km in ESE direction). Nearest Airport from plant site is Kolkata Airport (~26.5 km in NE direction). Study area map comprising direct impact area which includes area covered under 10 km radius from the project boundary is shown in **Figure 3.1.**

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

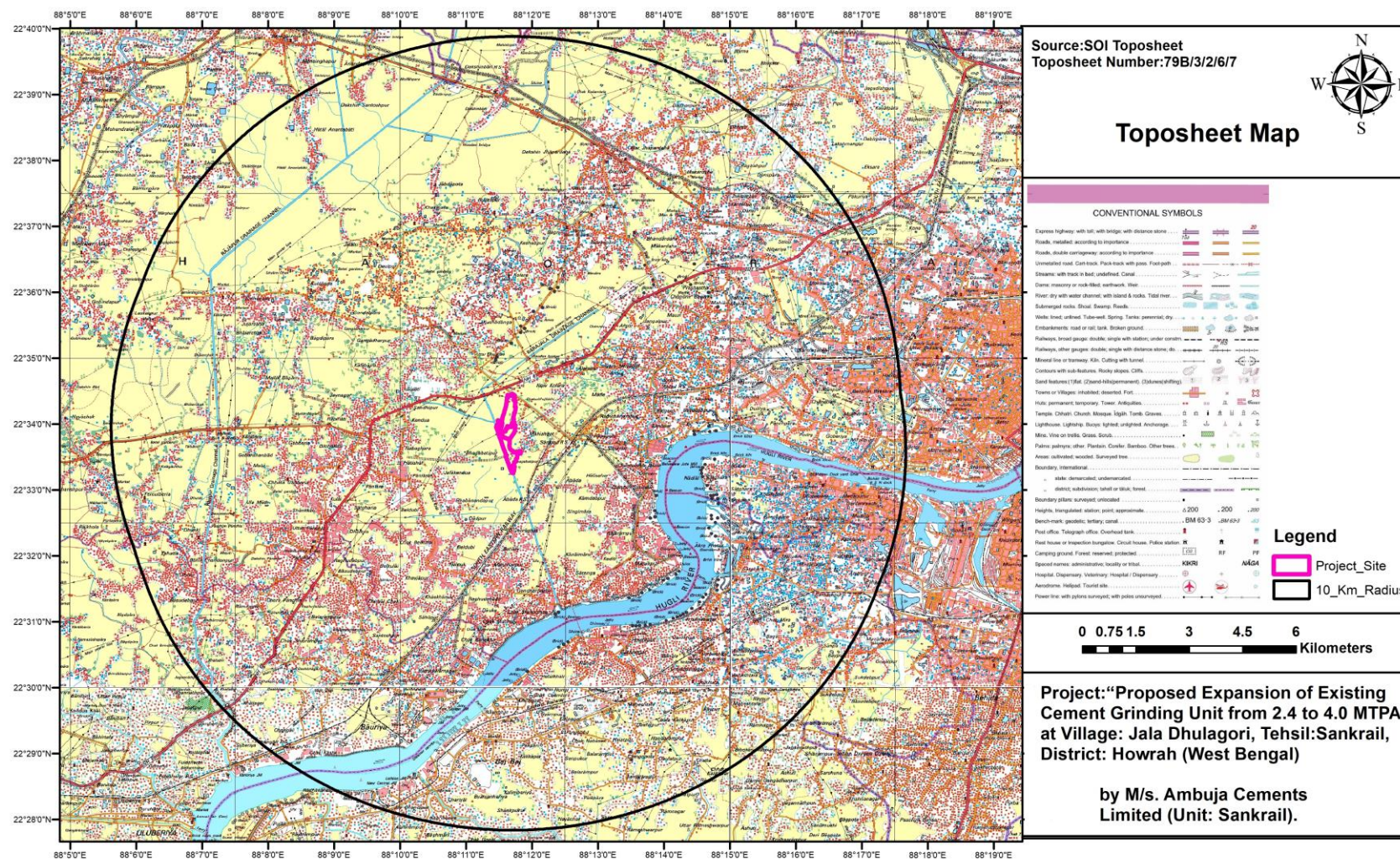


Figure 3.1 : Study Area TopoMap

3.2.1. Study Period

To establish the base line environmental status of the physico-chemical, biological, and socio-economic parameters in the project area and within the project influence area, the baseline study and primary data collection has been carried out during **1st March 2022 to 31st May 2022**. Field monitoring for meteorological conditions, ambient air quality, water quality, noise quality, soil quality etc. has been carried out, which constitute major portions of the Baseline environmental studies. In addition to these other major aspects like Geology, Hydrology, ground water and water conservation, Land use, Socio-economic study, Ecology, and biodiversity etc. have also been covered. All this information is based on primary and secondary information sources and surveys and constitute the baseline environmental studies. The entire data has been collected through actual physical surveys and observations, literature surveys, interaction with locals, government agencies and departments.

3.2.2. Environmental Setting and Salient Environmental Features of the Project Area

Proposed plant site is located at Village: Jala Dhulagori, Tehsil: Sankrail, District: Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail). The site is well connected to NH - 6 (~0.2 km in NW direction) and NH - 117 (~7.5 km in ENE direction). Nearest town is Andul (~5.5 km in ENE direction). Nearest Railway Station is Sankrail Railway Station (~1.5 km in ESE direction). Nearest Airport from plant site is Kolkata Airport (~26.5 km in NE direction).

Hoogly River is nearest river flowing at 4.0 km (ESE) from the ACI project site. Barajala drainage channel is flowing along the western boundary of the project site. No other river or stream is located within the study area. There is no national park, wildlife sanctuary, biosphere reserve, wetland, migratory corridor of wild fauna located within the 10 km area of the proposed site.

The nearest critically polluted is Jalan Industrial area located about 3.07 km in NE direction from plant site. There is no interstate boundary located within the study area. Nearest village to the plant site is Mahisgot located near the eastern boundary of the project. Nearest populated area is Sandhipur located about 2.08 km, west of the project site. Close view map of the project site showing plant coordinates is presented in **Figure 3.2**. Location map and Google map showing site and surrounding environment features within the 10-km area is provided in **Figure 3.3 & Figure 3.4** respectively. The Environmental Sensitivity of plant site within 500m, 2 km and 10 km radius are summarized at **Table 3.1**.

Table 3.1 : Environmental Sensitivity of Proposed Site and Study Area

S. No.	Environmental Features	Within 500 m-2 km area around Project Site	Within 2-5 km area around Project Site	Within 5-10 km area around Project Site
---------------	-------------------------------	---------------------------------------------------	-----------------------------------------------	------------------------------------------------

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

S. No.	Environmental Features	Within 500 m-2 km area around Project Site	Within 2-5 km area around Project Site	Within 5-10 km area around Project Site
1.	Ecological Environment			
A	Presence of Wildlife Sanctuary/ National Park/Biosphere Reserves	None	None	None
B	Reserved /Protected Forests	None	None	None
C	Wetland of state and national interest	None	None	None
D	Mangroves	None	None	None
E	Critically Polluted Area	Jalan Industrial Complex is located about 3.07 km from the plant boundary		
2.	Physical Environment			
F	Road Connectivity	NH-16 (0.29 km, N)	NH-16	NH-16 NH - 117 (~7.5 km in ENE)
G	Rail Connectivity	None	Sankrail Railway Station (1.5 km in ESE direction)	-
H	Defence Installation	None	None	None
I	Densely Populated Area	-	Sandhipur 2.08 km, west	Howrah and surroundings
J	village close to Plant Site	Mahisgot located near the eastern boundary		
K	Topography	2-5 amsl	0-33 amsl	
L	Seismicity	Seismic Zone-III (Moderate Risk Zone)		
M	Surface Water/ drain (Rivers/ Nala etc)	Barajala drainage channel west of site	None	Hoogly River 4.0 km (ESE)
3.	Social Environment			
N	Physical Setting	Industrial	Industrial commercial and Residential	Industrial commercial and Residential
O	Physical Sensitive Receptors	Asian International School (0.51km,	Yes School and hospitals	Yes School and hospitals

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

S. No.	Environmental Features	Within 500 m-2 km area around Project Site	Within 2-5 km area around Project Site	Within 5-10 km area around Project Site
		NE)		
P	Archaeological Monuments	None	None	None

(Source: EQMS)

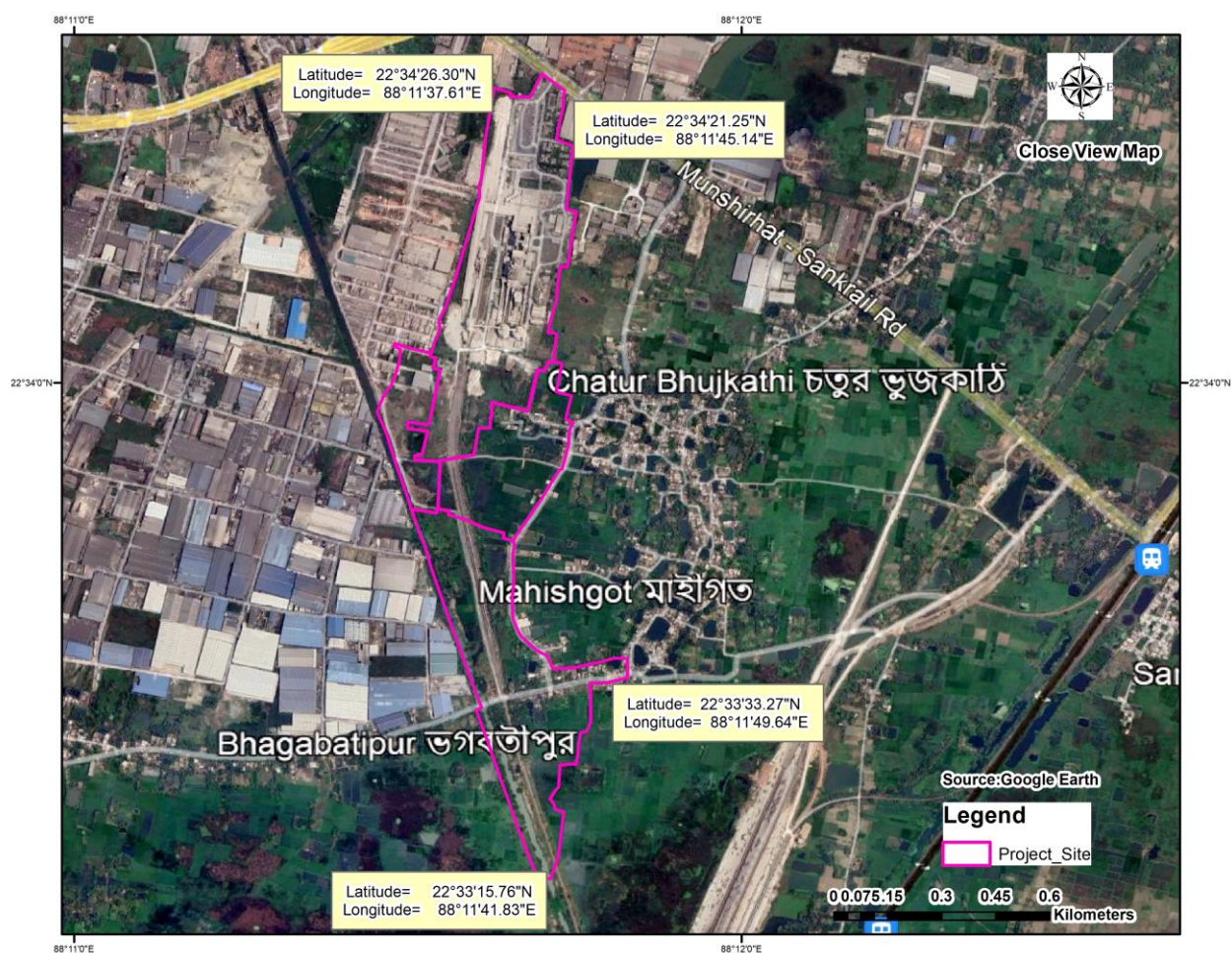


Figure 3.2 : Close view map of the project area

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

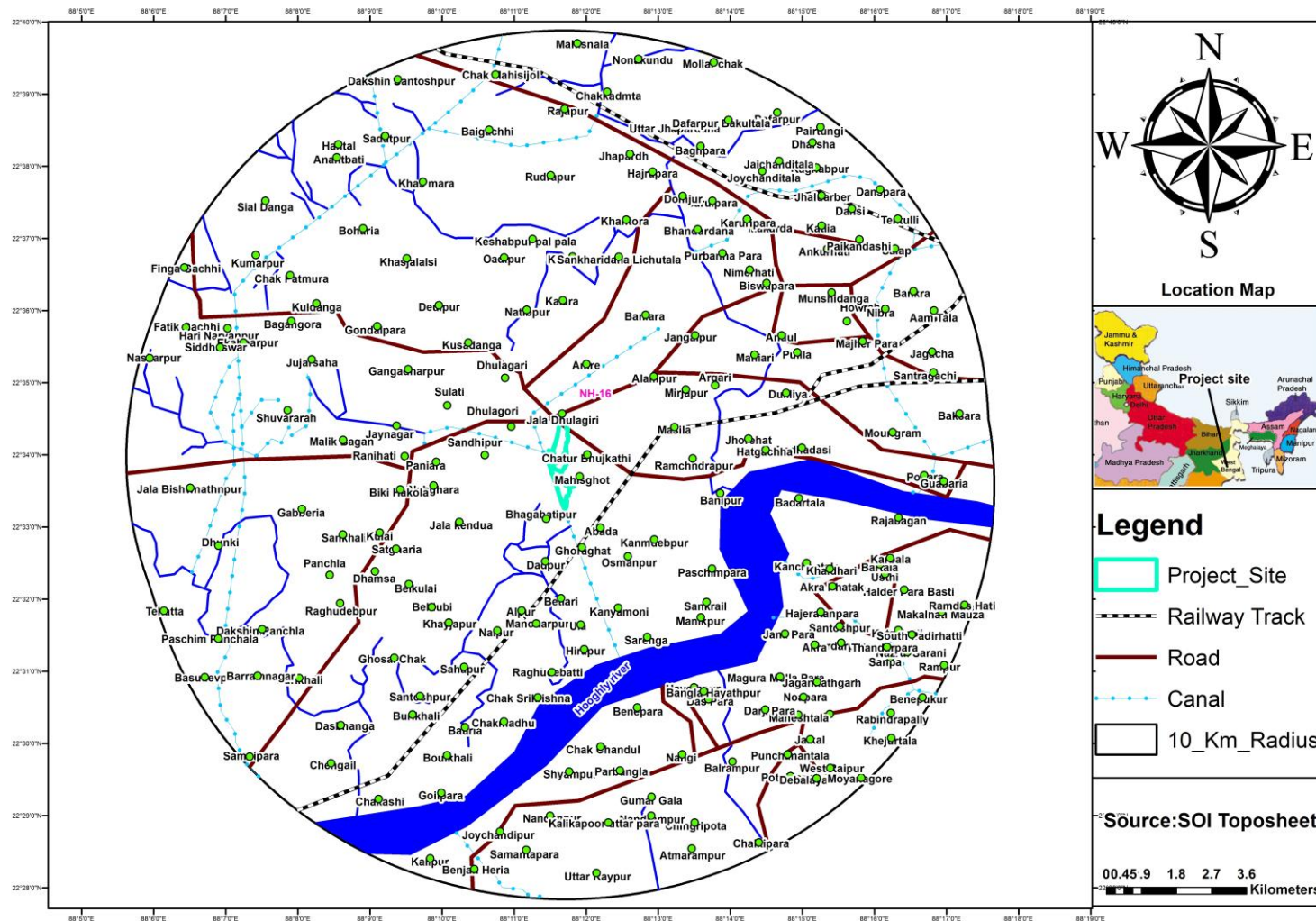


Figure 3.3 : Location Map showing Site & Surrounding Environmental Features within 10 km Area

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

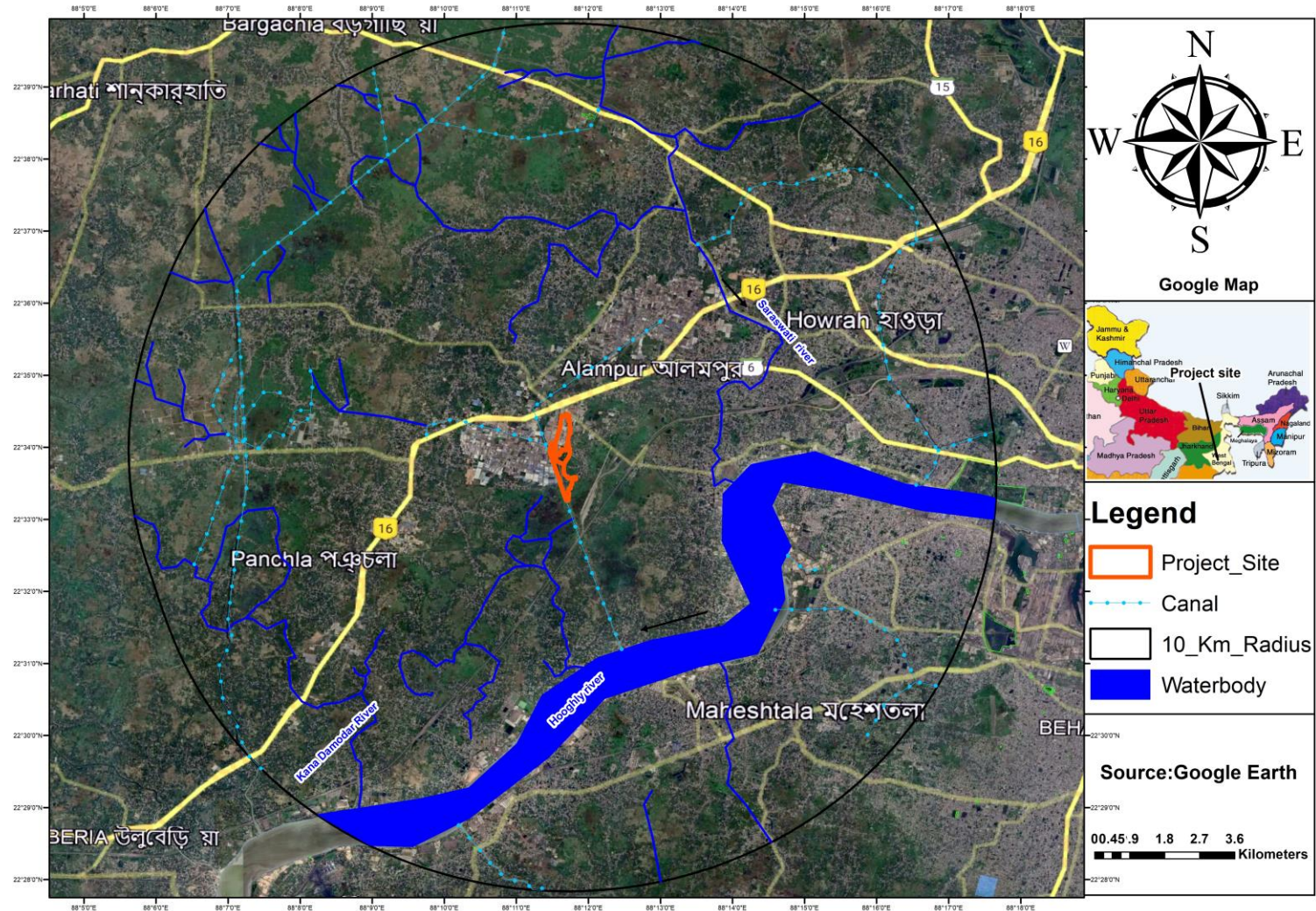


Figure 3.4 : Google Map showing Site & Surrounding Environmental Features within 10 km Area

3.3. Components of Methodology of Baseline Survey

3.3.1. Components of Baseline Survey

The guiding factors for the present baseline study are Ministry of Environment, Forests & Climate Change's (MoEF&CC) requirements for the Environmental Impact Assessment (EIA) notification and local regulations and directives. The methodology to conduct baseline environmental survey has been considered as per the guidelines given in the Environmental Impact Assessment Guidance Manual. Further, a buffer area extending up to 10 km radius from the site has been studied. The studies were conducted by consideration of the following:

The various environmental attributes were divided into primary and secondary studies. Primary attributes such as air environment, water, soil, noise, flora and fauna, and Socio- economic were assessed by conducting field studies, on-site monitoring and review of the past studies conducted.

Baseline data on environmental attributes (Air, Noise, Water and Soil) have been collected for One season i.e. summer Season (March, 2022 to May, 2022) in the study area. The data has been collected by the EIA Consultant by engaging NABL/MoEF accredited laboratory. Secondary attributes such as land use studies, geology, physiological characteristics, and socio-economic environment have been assessed by literature review of previous studies conducted by various government publications.

3.3.2. The Methodology Adopted for the EIA Study

An interdisciplinary team through discussions, criteria questions and professional judgement formulated the scoping and the extent of data generation. The baseline studies started with site visits and reconnaissance survey in the study area for fixing the monitoring locations for the primary data. As a secondary data review, various government agencies were approached for procuring information and relevant data of the area.

3.3.2.1 Physical Environment Study

The study related to physical environment shall be conducted through both site visits and review of the secondary sources like the DPR and other published peer information in respect of the topographical and physiographical features, regional and the local geology of the project area, climatology, and seismicity. Soil characteristics shall be establishing through physio-chemical tests of the soil samples revalidated through the published literature while land use and land cover, slope of the study area shall be establishing through remote sensing by using GIS tools.

The field observations and the results of the baseline study have been used-

- To assess the positive and negative impacts due to the proposed project.

- To suggest appropriate mitigation measures for negating the adverse environmental impacts, if any; and
- To suggest post-project monitoring requirements and suitable mechanism for it.

3.3.2.2 Primary Data Collection: Monitoring Plan and Quality Assurance Procedures

TOR issued for the project as well as standard methods and procedures have been strictly adhered to in the course of this study. QA/QC procedures were strictly followed which covers all aspects of the study, and includes sample collection, handling, laboratory analyses, data coding, statistical analyses, presentation, and communication of results. The baseline environmental data generation has been collected for the study period. The Summary of monitoring plan, methodology for primary and secondary baseline generation is summarized in **Table 3.2**. Sampling location map provided in **Figure 3.5**.

Table 3.2 : Summary of Methodology for Primary/Secondary Baseline Data Collection

Parameters	No. Of sampling locations	Frequency/ season	Remark
Ambient Air Quality			
PM ₍₁₀₎ , PM _(2.5) , SO ₂ , NO _x and CO	8 locations	Twice a Week For summer season	AAQ monitoring was carried out at 8 locations (representing upwind, downwind, and sensitive locations). 24 hours sampling at each location was carried out as per CPCB guidelines (CPCB Gazette notification dated 18.11.2009 on AAQ).
Meteorology			
Temperature, Humidity, Wind speed, Direction, Rainfall etc.	One location	Hourly for Summer season	Met station established at ACL site to record the site-specific hourly met. data.
Ground Water Quality			
Physical, chemical and biological parameters as per IS 10500	8 locations in study area	Once in a season	Ground water: Sampling was conducted at 8 locations. Samples were preserved, transported and analyzed for different parameters based on APHA methods. Temp, conductivity, and pH which were measured instantly at site itself.
Surface Water Quality			

Parameters	No. Of sampling locations	Frequency/ season	Remark
Physical, chemical and biological parameters as per IS: 10500	3 locations in study area	Once in a season	Surface Water: Sampling was conducted at Three locations. Samples were preserved and transported for analysis for different parameters based on APHA methods. Temp, conductivity, DO and pH which were measured instantly at site itself.
Soil			
Texture, bulk density, pH, conductivity, cation exchange capacity, organic matter, Total N, P, K, and Heavy metals etc	6 locations in study area	Once in a season	Soil samples were collected at six locations within the study area and analyzed as per IARI method
Noise			
Noise profiling for 24 hrs.	8 locations in study area	Once in season	Noise monitoring was conducted within the 10-km area of project site for noise profiling for 24 hrs using integrated sound level meter, as per CPCB guidelines.
Ecology (Flora & Fauna)			
Flora & Fauna		Once	Primary survey and Secondary sources
Demography & Socioeconomics			
Demography & Socioeconomic	-	Once	Primary survey/ Secondary sources

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori,Tehsil-Sankrail,
District-Howrah (West Bengal)by M/s. Ambuja Cements Limited (Unit: Sankrail)**

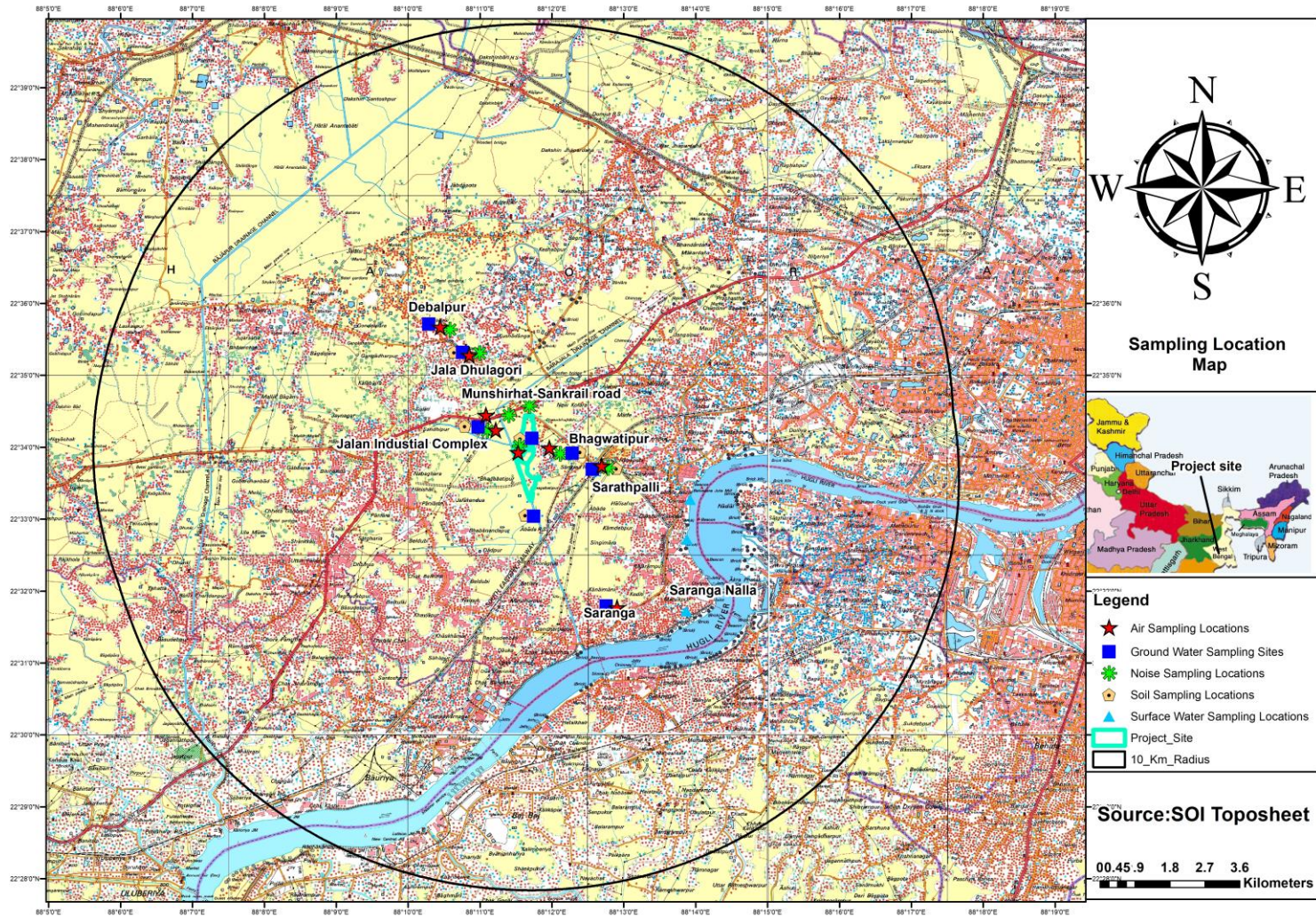


Figure 3.5 : Sampling location Map

3.3.3. Industries Located in Jalan Industrial Complex

Jalan Industrial Complex: Jalan Industrial Complex is a privately developed/promoted industrial hub whose area/boundary is not clearly defined. The area is not recognized as industrial zone/cluster by any governmental organization. The proposed site is located close to the Jalan Industrial complex. The complex comprises of Mouza- Begri, Baniara & Biprannapara. Jalan Industrial Complex is critically polluted area by CPCB.

The complex was started developing way back in 1984. The complex since then it is growing up exponentially in completely unplanned and unorganised manner. There are many industries are operating in this industrial complex. There are about 5 Highly Polluting Industries, 86 Red Category Industries and about 120 Green Category industries located in this park. – above 120 nos. The main air emission of these units is due to burning of fossil fuel like coal and furnace oil. Location Map showing distance of Jalan industrial complex from ACL boundary is presented in **Figure 3.6**.

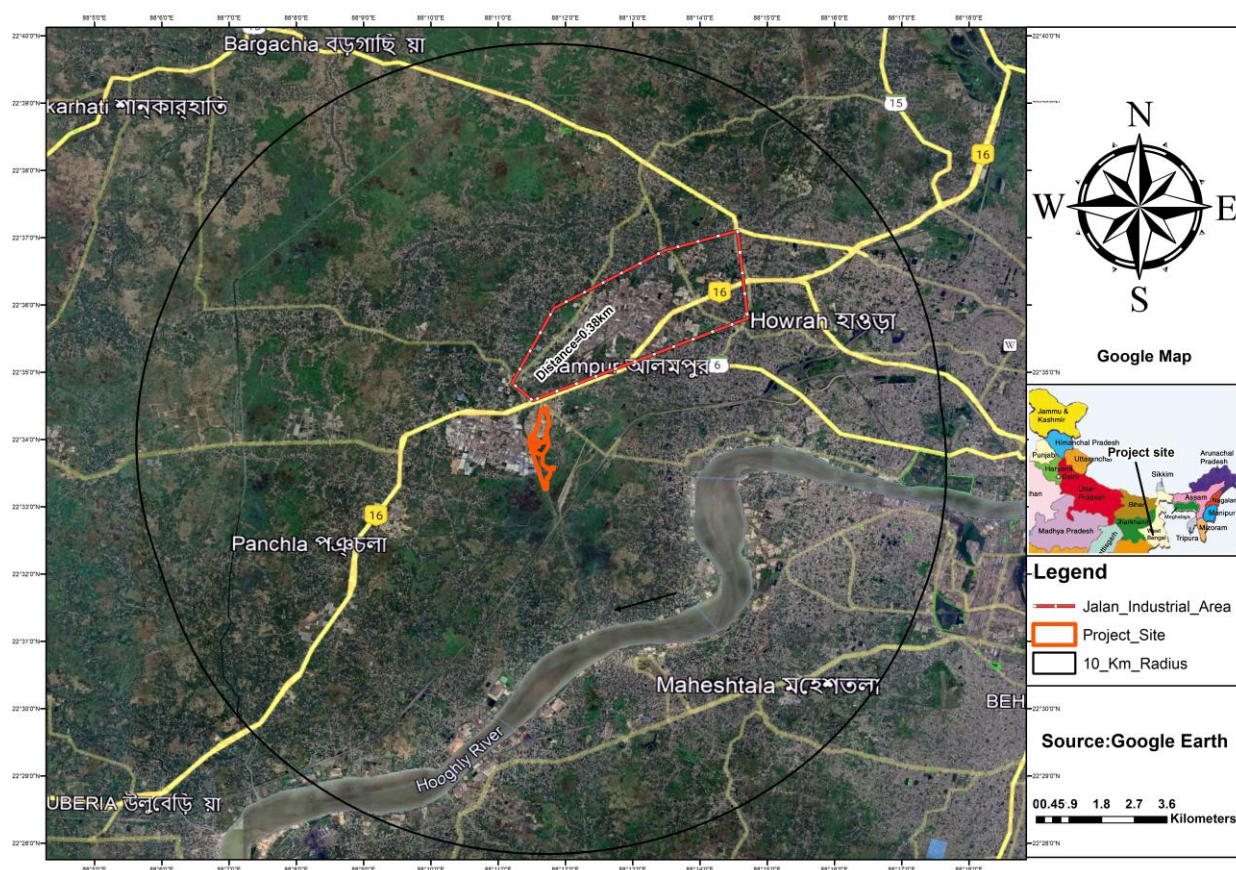


Figure 3.6 : Location Map of Jalan Industrial Complex

3.4. Topography, Physiography and Drainage

The topography of the project site as well as 10 km study area is almost plain. The elevation of the project site varying from 2 amsl to 5 amsl. The site is slightly sloping towards Hooghly river in southern side. The study area is also plain and the elevation of

the project site varying from 00 amsl to 33 amsl. Digital Elevation Map of the study area is presented in **Figure 3.7**.

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

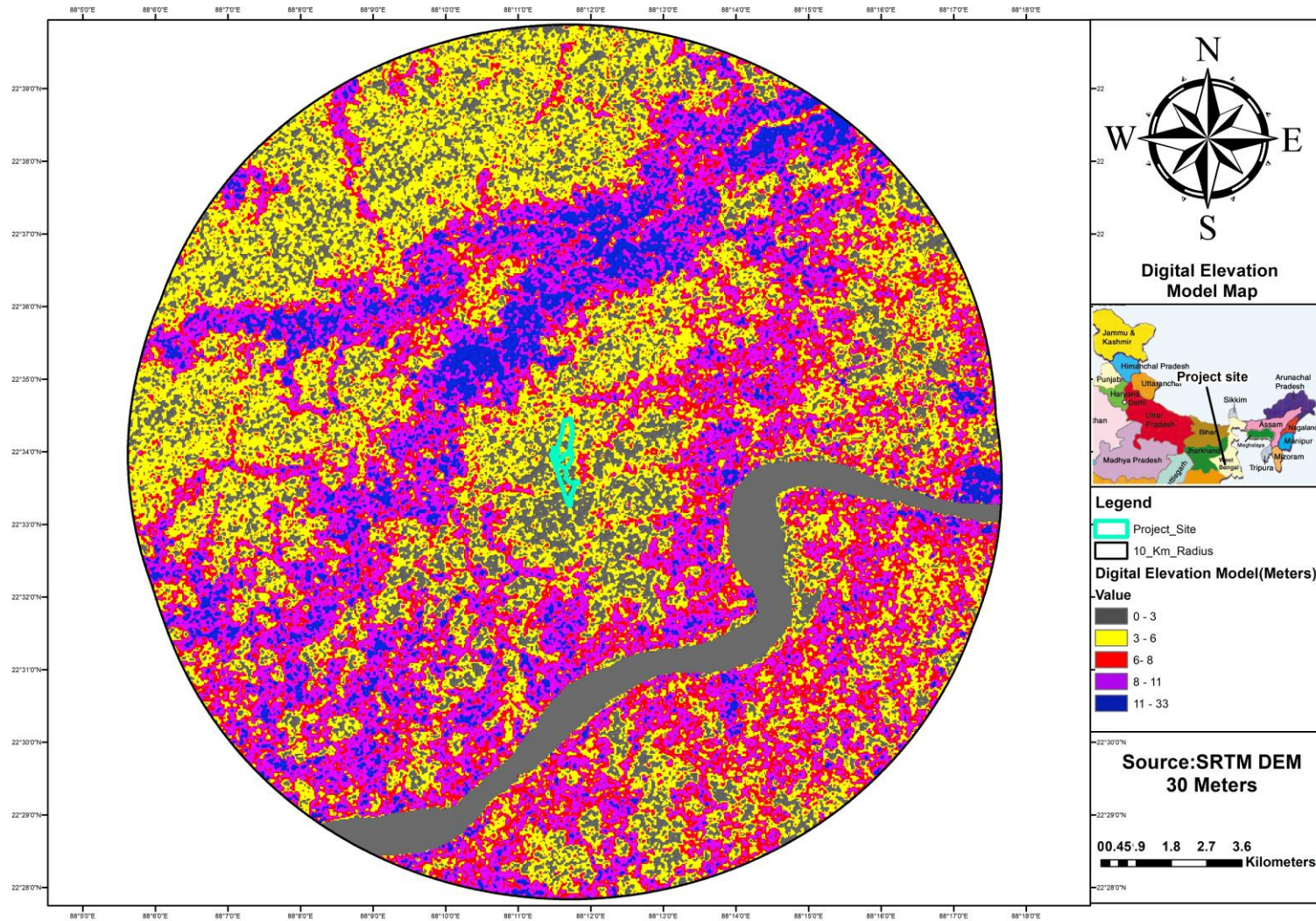


Figure 3.7 : Digital Elevation Map of Study area

Drainage: There is no nalla/ stream passing the project area. Drainage of the study area is mainly controlled by Hoogly river. The elevation of the project site varying from 2 amsl to 5 amsl. The site is slightly sloping towards Hoogly river in southern side. There is a nalla passing along the western boundary of the site. The storm water drainage of the eastern side is also controlled by this nalla. Drainage map of the study area (10 km area) is presented in **Figure 3.8**.

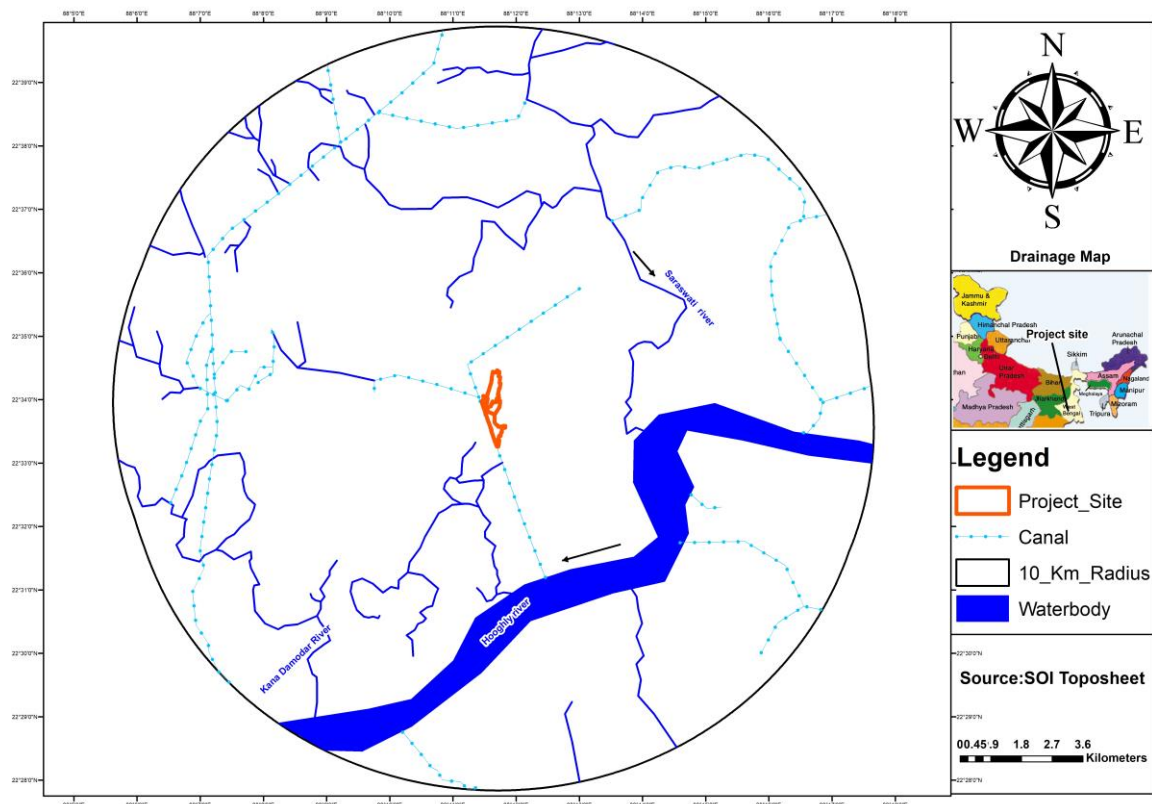


Figure 3.8 : Drainage Map of Study Area (10 km Radius)

3.5. Geology & Hydrogeology

3.5.1. Geology

Howrah district is underlain by consolidated quaternary alluvium laid down by the south flowing Bhagirathi-Hoogly River system. The alluvium sediments in the form of flood plain deposits consists of sands of various grades, silt, and clay with occasional gravel beds. The sand are fine to coarse grained and sub-rounded. Immediately below the land surface a thick layer of sticky clay ranging in thickness between 30-70 m and often broken either by sand lenses or silt is encountered. Exploratory drilling revealed that presence of clay bed even around a depth of 300 m bgl. Which continue even beyond a depth of 548 m bgl. Apart from persistence of clay beds at deeper levels, the exploration has also brought to light occurrence of potential and fresh aquifer zones of considerable thickness down to a depth of 300 m bgl.

3.5.2. Hydrogeology

Ground water in Howrah district occurs under both water table and confined to semi confined conditions in aquifer which starts from 4.236 m bgl. The shallow aquifer are tapped by dug wells, while the deeper aquifer are tapped by medium to heavy duty tubewells. Dugwells in the district generally vary in depth from 5-15 m bgl. The majority of them being restricted to 10 m depth. Some open wells tends to dry up in summer as they are restricted either to silty clay zone or tapped very little upper part of the aquifer. The fresh ground water aquifer occurs between 150-300 m bgl in most of the blocks.

3.5.2.1 Seismicity of Study Area

Based on tectonic features and records of past earthquakes, a seismic zoning map of India has been prepared by a committee of experts under the auspices of Bureau of Indian Standard (BIS Code: IS: 1893: Part I 2002). As per Seismic map of India the study area falls in Zone-III (Moderate Risk Zone).

3.5.2.1 Depth of Water Level

Howrah district is underlain by Quaternary sediments consisting of silt, clay, various grades of sand, gravel and occasional pebbles, deposited in deltaic environment by Ganga- Hoogly river system. Here ground water occurs under confined condition and the piezometric level is significantly deep, ranging between 0.44 & 19.63 mbgl during pre-monsoon period and between 0.37 & 10.76 mbgl during post-monsoon period in major part of the city. Depth-to-water level categorization of pre and post monsoon is presented in Table-3.3.

Table 3.3 : Pre-monsoon Depth to Water level in Howrah District

District	DTW (m. bgl)		Percent of the well having water Level between 0-2 m	Percent of the well having water Level between 2-5 m	Percent of the well having water Level between 5-10 m	Percent of the well having water Level between 10-20 m	Percent of the well having water Level between <20 m
	Min	Max					
Howrah	0.44	19.63	12.5 %	31.3%	12.5	43.8	Nil

Source: Aquifer System of West Bengal by CGWB

Table 3.4 : Post-monsoon Depth to Water level in Howrah District

District	DTW (m. bgl)		Percent of the well having water Level between	Percent of the well having water Level between	Percent of the well having water Level between	Percent of the well having water Level between	Percent of the well having water Level between
	Min	Max					

			0-2 m	2-5 m	5-10 m	10-20 m	<20 m
Howrah	0.35	10.76	38.5 %	7.7%	38.5	15.4	Nil

Source: Aquifer System of West Bengal by CGWB

As per CGWB all block in Howrah district the stage of ground water development is good and all the block including study area is in safe category.

3.6. Land use- Land Cover Classification

3.6.1. Introduction

Land use analysis was carried out using remote Sensing Data. Interpretation approach based on systematic digital imaging was used for delineating the land use classes. The demarcation of boundaries falling under different land use/land cover units is done using different colours assigned to different land use/land cover units of satellite imagery.

3.6.2. Land Use Based on Satellite Imagery

Satellite imagery contains detail records of features on the ground at the time of satellite overpass. An image interpreter systematically examines the images for generating the information required by him. Other supporting materials such as published maps and reports from various sources will increase the accuracy of the interpretation. The chain of process in visual interpretation of the shape and pattern in an image begins with detection. There are certain fundamental characteristics seen on images which aid in the visual interpretation of satellite imagery. These are tone / colour, size, shape, texture, pattern, location, association, resolution, and season. Visual interpretation is subjective and differs from person to person and upon the season, scale, spectral bands, spatial resolution, overall image contrast and quality of the data.

3.6.3. Data Source & Analysis

Remote Sensing Technique is used to prepare the present Land use Landover Map. A remotely sensed image is not considered a photograph. An image is a rendition, or model, of target features described using spectral reflectance. These reflectance values are stored in a quantitative, numerical fashion in a manner suitable for input to a computer. Software and hardware specially designed to analyse these images give us the ability to see a pictorial rendition of targets. The images that we see on a computer screen are made up of picture elements called pixels. These images which are "Discretized" are called as a digital image. Remote Sensing Data and few secondary data set were used to study and map the present Land Use pattern of the area. These are, Multi spectral and Multi temporal images are used as the input data. (FCC) Landsat-TM (MSS) multispectral & PAN imagery has been used as input data. The spatial resolution of the dataset is 30m & 15m. The bands used as input data for the current study have these following features

Band 2: 0.52 - 0.59 μm (green): This band corresponds to the green reflectance of healthy vegetation and is spanning the region between the blue and red chlorophyll absorption bands.

Band 3: 0.62 - 0.68 μm (red): This red chlorophyll absorption band of healthy green vegetation is one of the most important bands for vegetation discrimination. In addition, it is useful for soil-boundary and geological boundary mapping. Band 3 may exhibit more contrast than bands 1 and 2 because the effect of the atmosphere is reduced. The 0.69m cut-off represents the beginning of a spectral region from 0.68 to 0.75m where vegetation reflectance crossovers occur that can reduce the accuracy of vegetation studies.

Band 4: 0.77 - 0.86 μm (near infrared): For reasons discussed above, the lower cut-off for this band was placed above 0.75 m. This band is especially responsive to the amount of vegetation biomass present in a scene. It is useful for identification of vegetation types and emphasizes soil-crop and land-water contrasts

3.6.4. Other Secondary data

The secondary database considered for validation and geo-referencing of the image is as follows: US Army Sheet (1:250,000).

3.6.5. Digital Image Interpretation

Digital image processing is the use of computer algorithms to perform image processing on digital images. As a subfield of digital signal processing, digital image processing has many advantages over analog image processing; it allows a much wider range of algorithms to be applied to the input data and can avoid problems such as the build-up of noise and signal distortion during processing. In today's world of advanced technology where most remote sensing data are recorded in digital format, virtually all image interpretation and analysis involve some element of digital processing. Digital image processing may involve numerous procedures including formatting and correcting of the data, digital enhancement to facilitate better visual interpretation, or even automated classification of targets and features entirely by computer. To process remote sensing imagery digitally, the data must be recorded and available in a digital form suitable for storage on a computer tape or disk. Obviously, the other requirement for digital image processing is a computer system, sometimes referred to as an image analysis system, with the appropriate hardware and software to process the data. Several commercially available software systems have been developed specifically for remote sensing image processing and analysis.

3.6.6. Methodology

Most of the common image processing functions available in image analysis systems can be categorized into the following four categories:

1. Pre-processing



2. Image Enhancement
3. Image Transformation
4. Image Classification and Analysis

1. Pre-processing

Functions involve those operations that are normally required prior to the main data analysis and extraction of information and are generally grouped as radiometric or geometric corrections. Radiometric corrections include correcting the data for sensor irregularities and unwanted sensor or atmospheric noise and converting the data, so they accurately represent the reflected or emitted radiation measured by the sensor. Geometric corrections include correcting for geometric distortions due to sensor-Earth geometry variations, and conversion of the data to real world coordinates (e.g. latitude and longitude) on the Earth's surface.

2. Image Enhancement

The objective of the second group of image processing functions grouped under the term of image enhancement is solely to improve the appearance of the imagery to assist in visual interpretation and analysis. Examples of enhancement functions include contrast stretching to increase the tonal distinction between various features in a scene, and spatial filtering to enhance (or suppress) specific spatial patterns in an image.

3. Image transformations

Are operations similar in concept to those for image enhancement. However, unlike image enhancement operations which are normally applied only to a single channel of data at a time, image transformations usually involve combined processing of data from multiple spectral bands. Arithmetic operations (i.e., Subtraction, addition, multiplication, division) are performed to combine and transform the original bands into "new" images which better display or highlight certain features in the scene. We will look at some of these operations including various methods of spectral or band rationing, and a procedure called principal components analysis which is used to represent the information more efficiently in multichannel imagery.

4. Image classification and Analysis

Operations are used to digitally identify and classify pixels in the data. Classification is usually performed on multichannel data sets (A) and this process assigns each pixel in an image to a class or theme (B) based on statistical characteristics of the pixel brightness values. There are a variety of approaches taken to perform digital classification. We will briefly describe the two generic approaches which are used most often, namely supervised, and unsupervised classification. The intent of the classification process is to categorize all pixels in a digital image into one of several land covers classes, or "themes". This categorized data may then be used to produce thematic maps of the land cover present in an image. Normally, multispectral data are

used to perform the classification and, indeed, the spectral pattern present within the data for each pixel is used as the numerical basis for categorization (Lillesand and Kiefer, 1994). The objective of image classification is to identify and portray, as a unique gray level (or color), the features occurring in an image in terms of the object or type of land cover these features actually represent on the ground. Image classification is perhaps the most important part of digital image analysis. It is very nice to have a "pretty picture" or an image, showing a magnitude of colors illustrating various features of the underlying terrain, but it is quite useless unless to know what the colors mean. (PCI, 1997). Two main classification methods are Supervised Classification and Unsupervised Classification.

Supervised Classification: With supervised classification, we identify examples of the Information classes (i.e., land cover type) of interest in the image. These are called "training sites". The image processing software system is then used to develop a statistical characterization of the reflectance for each information class. This stage is often called "signature analysis" and may involve developing a characterization as simple as the mean or the range of reflectance on each band, or as complex as detailed analyses of the mean, variances and covariance over all bands. Once a statistical characterization has been achieved for each information class, the image is then classified by examining the reflectance for each pixel and deciding about which of the signatures it resembles most. (Eastman, 1995)

Unsupervised Classification: Unsupervised classification is a method which examines many unknown pixels and divides into a number of classes based on natural groupings present in the image values. Unlike supervised classification, unsupervised classification does not require analyst specified training data. The basic premise is that values within a given cover type should be close together in the measurement space (i.e. have similar gray levels), whereas data in different classes should be comparatively well separated (i.e. have very different gray levels) (PCI, 1997; Lillesand and Kiefer, 1994; Eastman, 1995) The classes that result from unsupervised classification are spectral classes which based on natural groupings of the image values, the identity of the spectral class will not be initially known, must compare classified data to some form of reference data (such as larger scale imagery, maps, or site visits) to determine the identity and informational values of the spectral classes. Thus, in the supervised approach, to define useful information categories and then examine their spectral separability; in the unsupervised approach the computer determines spectrally separable class, and then define their information value. (PCI, 1997; Lillesand and Kiefer, 1994) Unsupervised classification is becoming increasingly popular in agencies involved in long term GIS database maintenance. The reason is that there are now systems that use clustering procedures that are extremely fast and require little in operational parameters. Thus, it is becoming possible to train GIS analysis with only a general familiarity with remote sensing to undertake classifications that meet typical map accuracy standards. With suitable ground truth accuracy assessment

procedures, this tool can provide a remarkably rapid means of producing quality land cover data on a continuing basis

3.6.7. Ground truth study

A detailed ground truth was carried out to check the discrepancy of the interpreted data. Comprising of data collection of ground features along with the respective geographical position in terms of latitudes and longitudes.

3.6.8. Land use at 10 km Study area

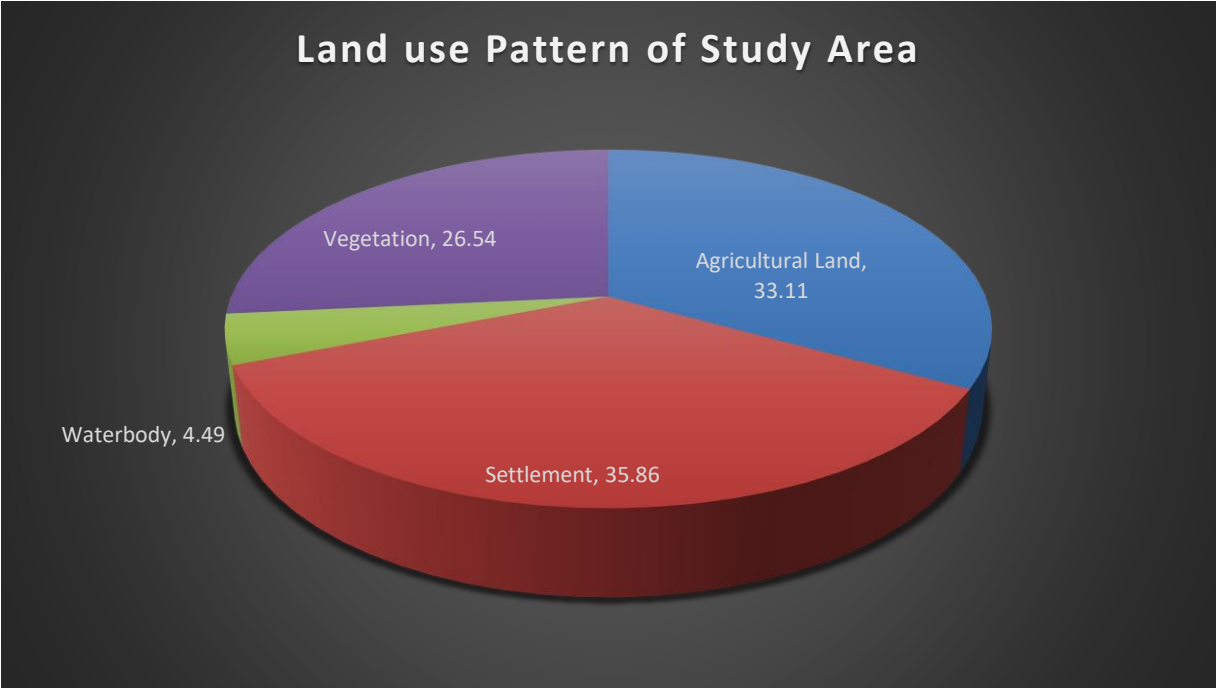
Land use analysis was carried out using remote Sensing Data. Interpretation approach based on systematic digital imaging was used for delineating the land use classes. The demarcation of boundaries falling under different land use/land cover units is done using different colours assigned to different land use/land cover units of satellite imagery.

Land use of project site is Industrial use. Most of the land within the 10 km area of the project Site is under agricultural, settlement and vegetation. As per the land use based on satellite image, about 33.11% of the land is under Agricultural Land. 26.54 % of land is under vegetation, 35.86 % of the land is under settlement, rest is under other uses. Refer **Figure 3.9** and **Table 3.5**). Land use map of the 10 km study area is shown in **Figure 3.10**.

Table 3.5 : Land use of the Study Area

Class	Area (Sq km)	Percentage (%)
Agricultural Land	120.13	33.11
Settlement	130.12	35.86
Waterbody	16.31	4.49
Vegetation	96.29	26.54
Total	362.85	100.00

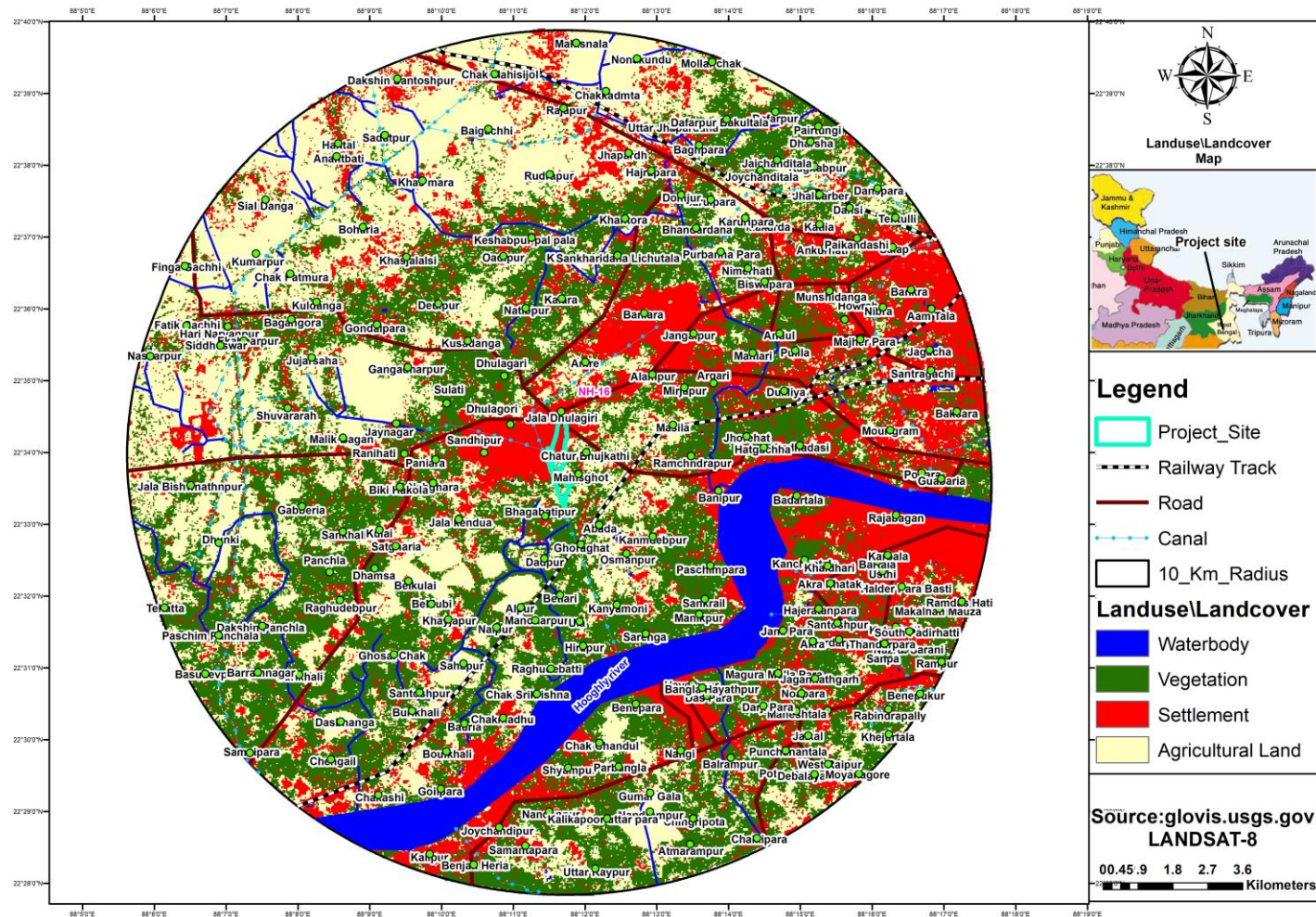
(Source: Satellite Data Analysis by EQMS)



(Source: Satellite Image Analysis by EQMS)

Figure 3.9 : Graph Showing Land Use of the Study Area (10 km Radius)

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**



(Source: Interpretation of Satellite Image)

Figure 3.10 : Land Use Map of the Study Area (10 km Radial Zone)

3.7. Soil Environment

Soil is the most important medium for supporting agricultural development. Its properties influence fertility, water retention capacity, physical support capacity of plant roots, determination of various other chemical constituent parameters. It is thus a vital necessity to study the nutrient status of soil regime.

3.7.1. Selection Criteria for Soil Sampling Location

For studying soil quality of the study area and with a view to ascertain the impacts due to proposed activities on the nearby agriculture, vegetative, urban settlement land, eight sampling locations, representing various land use conditions, were selected to assess the existing soil conditions in and around the project area. The location of the soil samples is presented in **Table 3.6**.

Table 3.6 : Soil Sampling Locations

Location Code	Sampling Location	Direction from Project Site (KM)	Aerial distance in km. w.r.t. of Project Site	Cordinates
S-1	Project Site	SITE	-	22.571642 N 88.198145 E
S-2	Near Jala Dhulagori	N (Upwind)	3.0	22.588055 N 88.181251 E
S-3	1 Km from Project Site	S (Downwind)	1.0	22.574060 N 88.184967 E
S-4	Jalan Industrial Complex	NE (Critical Polluted Area)	3.0	22.579641 N 88.198615 E
S-5	Bhagwatipur	SW	1.6	22.566342 N 88.199362 E
S-6	Sarathpalli	SE	1.7	22.561083 N 88.210663 E

Source: Monitoring Plan

3.7.2. Methodology

3.7.2.1 Sampling Technique

Soils vary from place to place. In view of this, efforts should be made to take the samples in such a way that it is fully representative of the field. Random five sub-locations were identified at each location. Scrap away surface liter; obtain a uniformly thick slice of soil from the surface to the plough depth from each place. A V-Shaped cut is made with a spade to remove 1 to 2 cm slice of soil. The sample may be collected on the blade of the spade and put in a clean bucket. In this way collect samples from all the spots marked for one sampling unit. In case of hard soil, samples are taken with the help of augur from the plough depth and collected in the bucket. Pour the soil from the bucket on a piece of clean paper or cloth and mix thoroughly.

Spread the soil evenly and divide it into 4 quarters. Reject two opposite quarters and mix the rest of the soil again. Repeat the process till left with about half kg of the soil, collect it and put in a clean cloth / polyethylene bag. Each bag should be properly marked with the name of sampling location & number to identify the sample.

3.7.2.2 Storage Technique

Collected Samples are immediately transported to the laboratory. They are shade dried in wooden or enameled trays (except for the analysis of moisture content) and stored. The dried soils are ground using mortar and pestle (taking care to break only the clods but not the sand and gravel particles) and sieved through a 2mm mesh sieve.

3.7.2.3 Soil Quality Parameters and Method of Analysis

The analysis of soil properties shall be done as per standard methods as described in the Methods Manual of Soil Testing in India, Department of Agriculture & Co-operation, Ministry of Agriculture, Government of India, New Delhi **(Table 3.7)**.

Table 3.7 : Method for Analysis of Soil Properties

S. No.	Parameters	Methods of Analysis
Physical Parameters		
1	Moisture content (%)	Gravimetric
2	Water Holding Capacity (%)	Gravimetric
3	Bulk Density (%)	Gravimetric
4	Texture	Hydrometer Method
Chemical Parameters		
5	pH	Electrometric (pH meter)
6	EC ($\mu\text{S}/\text{m}$)	Electrometric
7	Acidity (mg/kg)	Titrimetric
8	Alkalinity (mg/kg)	Titrimetric
9	Chloride (mg/kg)	Titrimetric
10	Calcium (mg/kg)	Titrimetric
11	Magnesium (mg/kg)	Titrimetric
12	Sodium (mg/kg)	Flame Photometer
13	Potassium (mg/kg)	Flame Photometer
14	Available Potassium (mg/kg)	Flame Photometer
15	Sulphate (mg/kg)	Spectrophotometer
16	Nitrate (mg/kg)	Kjedahl method
17	Phosphate (mg/kg)	Bray's Extractant
18	Available Phosphorus (mg/kg)	Spectrophotometer
19	Organic Carbon (%)	Wet Digestion

3.7.2.4 Protocol for Assessment of Soil Physico-Chemical Properties

Methods of Manual of Soil Testing in India, Department of Agriculture & Cooperation, Ministry of Agriculture, Government of India, New Delhi, were followed for collection of soil samples, preparation for testing and analyzing various physico-chemical properties of soil.

3.7.3. Soil Quality Analysis

Analysis of various soil properties, their characteristics and quantitative determination of soil in Project Site and its surrounding have been done. Such analysis has been carried out for surface soil only. Among the various soil properties, the following are accounted for.

1. Soil mechanical analysis
2. Soil reaction (pH)
3. Organic matter content
4. Nitrogen content
5. Phosphorous content
6. Base Exchange capacity.

The physical and chemical analysis results of the soil samples collected at site during **summer season**, are presented in **Table 3.8**:

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

Table 3.8 : Physicochemical Characteristics of Soil

S.No	Parameter	Unit	Project Site	Near Jala Dhulagori	1 Km from Project Site	Jalan Industial Complex	Bhagwatipur	Sarathpalli
			S1	S2	S3	S4	S5	S6
1	Texture	-	Sandy Clay Loam	Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy loam	clay loam
	Sand	%	61.9	41.9	60.2	56.4	68.4	43.9
	Silt	%	16.5	33.5	17.5	23.2	12.7	21.5
	Clay	%	21.6	24.6	22.3	20.4	18.9	34.6
2	pH (1:2.5)	-	7.26	7.43	7.39	7.18	6.99	7.81
3	Electrical Conductivity (1:2)	µS/cm	264	283	208	312	172	194
4	Cation exchange capacity	meq/100 gm	14.9	15.9	12.8	15.8	10.6	11.3
5	Exchangeable Sodium	mg/kg	182	144	156		94	124
6	Exchangeable Calcium	mg/kg	2208	2416	1862	2428	1534	1682
7	Exchangeable Magnesium	mg/kg	342	366	314	416	268	246
8	Sodium Absorption Ratio	mg/kg	0.95	0.72	0.88	0.00	0.58	0.75
9	Available Boron	mg/kg	0.34	0.39	0.29	0.21	0.44	0.41
10	Organic Carbon	%	0.53	0.51	0.62	0.44	0.76	0.63
11	Iron (Available)	mg/kg	8.6	8.1	9.2	7.4	13.6	12.1
12	Copper (Available)	mg/kg	1.04	1.17	1.41	1.23	1.62	1.31
	Available Nutrients:							
13	Nitrogen as N	kg/ha	248	282	226	188	306	312
14	Phosphorus(Olsen's) as P	kg/ha	10.9	12.4	10.2	9.4	16.1	15.4
15	Potassium as K	kg/ha	189	172	168	158	242	268

(Source: Soil sample analysis via Lab)

3.7.4. Soil Reaction Classes and Critical Limits for Macro and Micronutrients in Soil

According to Soil Survey Manual (IARI, 1970), the soils are grouped under different soil reaction classes viz. as mentioned below in **Table 3.9**

Table 3.9 : Soil Reaction Classes

Parameter	Range	Property of Soil
Soil Reaction Classes (pH)	pH<4.5	Extremely acidic
	pH 4.5-5.0	Very strongly acidic
	pH 5.1-5.5	Strongly acidic
	pH 5.6-6.0	Moderately acidic
	pH 6.1-6.5	Slightly acidic
	pH 6.6-7.3	Neutral
	pH 7.4-7.8	Slightly alkaline
	pH 8.5-9.0	Strongly alkaline
Organic Carbon (OC)	<0.50%	Low
	0.50-0.75%	Medium
	>0.75%	High
Available Nutrients (Fertility Status)		
Available Nitrogen	<280 kg/ha	Low
	280 to 560 kg/ha	Medium
	>560 kg/ha	High
Available Phosphorous	<10 kg/ha	Low
	10 to 25 kg/ha	Medium
	>25 kg/ha	High
Available Potassium	<108 kg/ha	Low
	108 to 280 kg/ha	Medium
	>280 kg/ha	High
Micronutrient	Critical Value	
Mn	<0.5 mg/kg	Deficient
Zn	<2.0 mg/kg	Deficient
Cu	<0.2 mg/kg	Deficient
(Singh et. al. 2004, Mehta et. al.1988, Follet & Lindsay 1970 and Berger &Truog, 1940)		

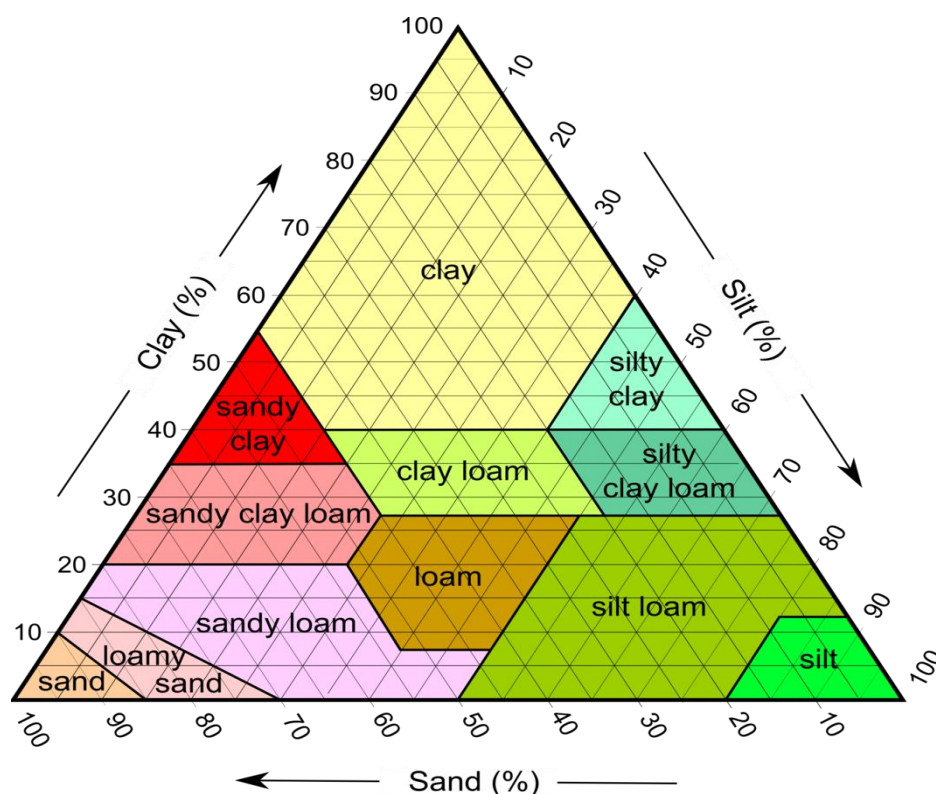


Figure 3.11 : Soil Texture Triangle

Interpretation of Soil Characteristic

Soil Texture: Soil mechanical analyses have been based on the analytical results of distribution of sand, silt and clay content of soil. In many soil gravel, stones and bedrock outcrop also effect texture and influences on land use. As per the grain size distribution the percentage of Sand in all sampled soil was found varied from 41.9% to 68.4%, Silt varied from 12.7 to 33.5% and Clay from 18.9% to 34.6% during summer season. Thus, the soil texture is Sandy Clay Loam.

Soil Reaction: Soil reaction is the most important single chemical characteristic influencing many physical and chemical properties of soil. Plant growth and microorganism activity depends upon soil reaction and the factors associated with it. There can be three types of soil reaction, which are acidity, alkalinity and neutrality. Soil reaction is measured by pH (Puissance de Hydrogen) of a suspension of soil in water. It represents concentration or activity of hydrogen ion. pH expresses the relationship between H^+ and OH^- . In the pH scale, the pH value ranges from 0-14, where pH, 0 represents the highest limit of active acidity and pH 14 the highest degree of alkalinity. Neutral represents pH 7.

The soil pH ranges were observed from 6.99 to 7.81 during study season, thereby indicating the soil are vary Neutral to Slightly Alkaline in nature.

Organic Carbon: The effect of soil organic matter on soil properties is well recognized. Soil organic matter plays a vital role in supplying plant nutrients, cation exchange capacity, improving soil aggregation and hence water retention and soil biological activity. The Organic Carbon content of sampled soil during study varied from 0.44% to 0.76%, thereby implying that soils are vary Low to High organic content.

Macronutrients: Nutrients like nitrogen (N), phosphorus (P) and potassium (K) are considered as primary nutrients and sulphur (S) as secondary nutrient. These nutrients help in proper growth, development and yield differentiation of plants and are generally required by plants in large quantity.

Available Nitrogen: Nitrogen is an integral component of many compounds including chlorophyll and enzyme essential for plant growth. It is an essential constituent for amino acids which is building blocks for plant tissue, cell nuclei and protoplasm. It encourages aboveground vegetative growth and deep green color to leaves. Deficiency of nitrogen decreases rate and extent of protein synthesis and result into stunted growth and develop chlorosis. Available nitrogen content in the surface soils ranges between 188 kg/ha to 312 kg/ha thereby indicating that soils are Low to Medium available nitrogen content.

Available Phosphorus: Phosphorus is important component of adenosine di-phosphate (ADP) and adenosine tri-phosphate (ATP), which involves in energy transformation in plant. It is essential component of deoxyribonucleic acid (DNA), the seat of genetic inheritance in plant and animal. Phosphorous take part in important functions like photosynthesis, nitrogen fixation, crop maturation, root development, strengthening straw in cereal crops etc. The availability of phosphorous is restricted under acidic and alkaline soil reaction mainly due to P-fixation. In acidic condition it get fixed with aluminum and iron and in alkaline condition with calcium. Available phosphorus content ranges between 9.4 kg/ha to 16.1 kg/ha thereby indicating that soils are vary Low to Medium in available phosphorus

Available Potassium: Potassium is an activator of various enzymes responsible for plant processes like energy metabolism, starch synthesis, nitrate reduction and sugar degradation. It is extremely mobile in plant and help to regulate opening and closing of stomata in the leaves and uptake of water by root cells. It is important in grain formation and tuber development and encourages crop resistance for certain fungal and bacterial diseases. Available potassium content in these soils ranges between 158 kg/ha to 268 kg/ha thereby indicating that the soils are Medium in potassium content.

Table 3.10 : Soil Class Interpretation

Parameter	Interpretation			
	Core Zone		Buffer Zone	
	Value	Category	Value	Category
Soil Reaction Classes (pH)	7.26	Neutral	6.99 to 7.81	Slightly Alkaline

Parameter	Interpretation			
	Core Zone		Buffer Zone	
	Value	Category	Value	Category
Organic Carbon (OC)	0.53 %	Medium	0.44 to 0.76%	Medium
Available Nutrients (Fertility Status)				
Available Nitrogen	248 kg/ha	Low	188 to 312 kg/ha	Medium
Available Phosphorous	10.9 kg/ha	Medium	9.4 to 16.1 kg/ha	Medium
Potassium	189 Kg/ha	Medium	158 to 268 kg/ha	Medium
Micronutrient				
Cu	1.04 mg/kg	Non-Deficient	1.17 to 1.62 mg/kg	Non-Deficient
(Singh et. al. 2004, Mehta et. al.1988, Follet & Lindsay 1970 and Berger & Truog, 1940)				

3.7.5. Soil Nutrient Index

Soil nutrient status for N, P & K is better explained by working out Nutrient Index Value for each. Parker had classified the 'Nutrient Index' values less than 1.5 as the indicative of low nutrient status and between 1.5 to 2.5 as medium while higher than 2.5 as high nutrient status.

The following equation is used to calculate Nutrient Index Value;

$$\text{Formulae: - [Nutrient Index} = \{(NI \times 1) + (Nm \times 2) + (Nh \times 3)\} / Nt]$$

Where;

Nt = Total number of samples analyzed for a nutrient in any given area.

NI = Number of samples falling in low category of nutrient status.

Nm = Number of samples falling in medium category of nutrient status.

Nh = Number of samples falling in high category of nutrient status

$$\text{Nutrient Index Value for, N} = \{(2 \times 1) + (6 \times 2) + (0 \times 3)\} / 8 = 1.5 \text{ (Medium)}$$

$$\text{Nutrient Index Value for, P} = \{(0 \times 1) + (8 \times 2) + (0 \times 3)\} / 8 = 1.83 \text{ (Medium)}$$

$$\text{Nutrient Index Value for, K} = \{(0 \times 1) + (8 \times 2) + (0 \times 3)\} / 8 = 2.0 \text{ (Medium)}$$

Inference: Thus, based on Nutrient Index Value for N, P & K, the soils of study area fall into "MEDIUM FERTILITY STATUS". Soils have medium organic carbon and are capable of moderately supporting for agriculture. The soils of study area area and project site is slightly alkaline in nature as pH value of soils in all analyzed samples is less than 8.5 and simultaneously the value of EC is less than 1 dS/m (1000 µmhos/cm).

3.8. Water Environment

Water quality is a complex subject, which involves physical, chemical, hydrological, and biological characteristics of water and their complex and delicate relations. The quality of water is of vital concern for mankind since it is linked with human welfare. Water quality characteristics of aquatic environments arise from multitude of physical, chemical, and biological interactions. The water bodies are continuously subjected to dynamic state of changes with respect to their geo-chemical characteristics. The dynamic balance in aquatic ecosystem is upset by human activities.

For assessment of baseline data of water quality status, general reconnaissance survey of River upstream and downstream of proposed study area will be done. "Protocol for Water Quality Monitoring" notified by Govt of India in conjunction with CPCB Guidelines for Water Quality Monitoring, 2007-08, shall be followed.

3.8.1. Reconnaissance Survey

The objectives of water quality monitoring programme are identification of state and trends in water quality, both in terms of concentrations and effect. It is pertinent to make a reconnaissance survey of the river during the planning stage, noting all sources of wastes, all entering tributaries that might contribute a potential pollutant, and all uses and abstractions of the water. This action will also include a survey of background information such as geography, topography, climate and weather, hydrology, hydrogeology, land use, urbanization, industrialization, and agriculture, including farming in the riverbed. The information required has been collected through primary surveys and secondary sources. Surface water sources and groundwater sources covering 10 km radial distance were identified for examining for physico-chemical and bacteriological parameters. Narmada canal is the main water bodies in the area.

3.8.2. Selection Criteria for Water Sampling Location

The selection of sites for water sampling was done considering the location of different project components, junction of streams and river course, spots of high-water velocity and some of the stagnated pools along with the areas having human interference. Sampling stations should be located upstream and downstream of significant pollution outfalls like city sewage drains and industrial effluent outfalls. Drinking water intake points, bathing ghats, irrigation canal off-take points should be considered for monitoring. Additional downstream stations are necessary to assess the extent of the influence of an outfall and locate the point of recovery. Stations on both sides downstream are useful to make an estimate of the extent of the mixing zone. In case of groundwater sampling only tubewells, dug-well and handpumps which are in use should be selected.

Eight ground water samples were collected from the study area. Ground water samples were collected from dugwells and borewell present in the study area. The location details of the surface and ground water monitoring stations is presented in

Table 3.11.



Table 3.11 : Water Quality Sampling Stations

Location code	Sampling Location	Direction wrt to plant site	Distance w.r.t. to plant site
Surface water sampling locations			
SW1	Hoogly River, (Up Stream)	SE	4.5
SW2	Hoogly River, (Down Stream)	SE	4.6
SW3	Sarenga Nallah	SSE	6.0
Ground Water Sampling locations			
GW-1	Project Site	-	-
GW -2	Near Jala Dhulagori	North	3.0
GW -3	1 Km from Project Site	South	1.0
GW -4	New Saranga	South	6.5
GW -5	Debalpur	NW	5.4
GW -6	Jalan Industrial Complex -1	NE (Critical Polluted Area)	3.0
GW -7	Bhagwatipur	SW	1.6
GW -8	Sarathpalli	SE	1.7

Source : Monitoring Plan

3.8.3. Sampling Frequency

Grab samples of surface and ground water were collected and analyzed once during study period (summer season).

3.8.4. Sampling Technique

Grab samples have been collected from well-mixed section of the river (mainstream) 30 cm below the water surface. Samples from reservoir sites will be collected from the outgoing canal, power channel or water intake structure. DO is determined in a sample collected in a DO bottle using a DO sampler. The DO in the sample was fixed immediately after collection, using chemical reagents. Ground water sample from dug well was collected about 30 cm below the surface of the water. Tubewell samples were collected after running the well for about 5 minutes. Some parameters like pH, dissolved oxygen, temperature, conductivity, and turbidity should be analyzed in situ.

3.8.4.1 Sample Preservation and Transport

Samples for BOD and bacteriological analyses should be stored at a temperature below 4°C and in the dark as soon as possible after sampling by placing them in an insulated cool box together with ice or cold packs. Samples collected for chemical oxygen demand (COD) should be preserved below pH 2 by addition of concentrated sulphuric acid. Samples which are to be analyzed for the presence of heavy metals,

should be acidified to below pH 2 with concentrated nitric acid. Samples were transported to concerned laboratory within 48 hours for testing.

3.8.4.2 Parameters considered for Analysis

In general list of parameters to be considered for analysis and frequency of sampling is provided in the “Protocol for Water Quality Monitoring” notified by Govt of India should be followed.

3.8.5. Water Quality

Ground water Quality: Water sampling and analysis has been carried out through NABL accredited and MoEF recognized Laboratory to determine the existing baseline water quality around the project area. Sampling and analysis have been carried out following standard guidelines for physical, chemical and bacteriological parameters. The physical, chemical and biological analysis results of the ground water samples are presented in **Table 3.12:**

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

Table 3.12 : Ground water Quality

S. No	Parameters	Unit	Max Requirement as per		GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
			(IS-10500-2012), Limit									
			Desirable	Permissible								
1	pH value	-	6.5-8.5	No Relaxation	7.47	7.25	7.23	7.53	7.24	7.38	7.45	7.40
2	Color	Hazen	5	15	<5	<5	<5	<5	<5	<5	<5	<5
3	Turbidity	NTU	1	5	<1	<1	<1	<1	<1	<1	<1	<1
4	Total Dissolved Solids	mg/l	500	2000	1273	452	1725	543	868	1213	1729	1341
5	Total Alkalinity as CaCO ₃	mg/l	200	600	356	240	455	324	366	378	436	324
6	Total Hardness (as CaCO ₃)	mg/l	200	600	568	280	496	352	470	460	520	480
7	Calcium (as Ca)	mg/l	75	200	131	62	93	77	176	80	108	86
8	Magnesium (as Mg ²⁺)	mg/l	30	100	57.7	30.0	63.2	38.3	7.2	62.4	60.0	63.6
9	Chlorides (as Cl)	mg/l	250	1000	458	72	618	76	220	408	652	510
10	Fluoride (as F)	mg/l	1	1.5	0.5	0.5	0.6	0.4	0.4	0.5	0.3	0.6
11	Sulphate (as SO ₄)	mg/l	200	400	32	32	64	26	38	35	43	38
12	Iron (as Fe)	mg/l	1	No Relaxation	0.31	0.11	0.24	0.14	0.19	0.13	0.21	0.18
13	Nitrate(as NO ₃)	mg/l	45	No Relaxation	9.6	6.1	12.4	6.9	8.7	9.2	7.1	10.3
14	Copper (as Cu)	mg/l	0.05	1.5	<0.0 5	<0.0 5	<0.0 5	<0.0 5	<0.0 5	<0.0 5	<0.0 5	<0.0 5
15	Boron (as B)	mg/l	0.5	2.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
16	Manganese(as Mn)	mg/l	0.1	0.3	<0.0 5	<0.0 5	<0.0 5	<0.0 5	<0.0 5	<0.0 5	<0.0 5	<0.0 5
17	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.0 01	<0.0 01	<0.0 01	<0.0 01	<0.0 01	<0.0 01	<0.0 01	<0.0 01
18	Sulphide (as H ₂ S)	mg/l	0.05	No Relaxation	<0.0 5	<0.0 5	<0.0 5	<0.0 5	<0.0 5	<0.0 5	<0.0 5	<0.0 5
19	Zinc (as Zn)	mg/l	5	15	0.23	0.13	0.25	0.17	0.19	0.16	0.24	0.18
20	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.0 03	<0.0 03	<0.0 03	<0.0 03	<0.0 03	<0.0 03	<0.0 03	<0.0 03
21	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.0	<0.0	<0.0	<0.0	<0.0	<0.0	<0.0	<0.0

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

					5	5	5	5	5	5	5	5
22	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.0 1	<0.0 1	<0.0 1	<0.0 1	<0.0 1	<0.0 1	<0.0 1	<0.0 1
23	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.0 01	<0.0 01	<0.0 01	<0.0 01	<0.0 01	<0.0 01	<0.0 01	<0.0 01
24	Total Arsenic (as As)	mg/l	0.01	0.05	<0.0 2	<0.0 2	<0.0 2	<0.0 2	<0.0 2	<0.0 2	<0.0 2	<0.0 2
25	Total Chromium (as Cr)	mg/l	0.05	No Relaxation	<0.0 5	<0.0 5	<0.0 5	<0.0 5	<0.0 5	<0.0 5	<0.0 5	<0.0 5
26	Total Coliform	per 100ml	Shall not be detectable		Abse nt	Abse nt	Abse nt	Abse nt	Abse nt	Abse nt	Abse nt	Abse nt
27	E.Coli	E.coli/1 00ml	Shall not be detectable		Abse nt	Abse nt	Abse nt	Abse nt	Abse nt	Abse nt	Abse nt	Abse nt

NOTE : ND-Not Detected, NR-No Relaxation; It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source', above which the sources will have to be rejected.

3.8.5.2 Interpretation of Ground Water Quality

Above Table shows the physico - chemical characteristics of ground water samples collected from the selected location during summer season 2022 as compared with the standard (IS 10500: 2012).

The analysis results indicate that the pH ranged between 7.23 to 7.53, which are well within the specified standard of 6.5 to 8.5 limit. Total hardness was recorded to range from 280 to 568 mg/l, which is within the permissible limit 600 mg/l at all locations. The Total Dissolved Solids (TDS) concentration recorded ranged between 452 to 1729 mg/l and was within the permissible limits (2000 mg/l) at all locations. Chlorides at all the locations were within the permissible limits (1000 mg/l) as it ranged between 72 – 652 mg/l. Sulphates at all the locations were within the permissible limits (400 mg/l) as it ranged between 26 – 63 mg/l. Bacteriological studies reveal that no coliform bacterial are present in the samples. The heavy metal contents were observed to be in below detectable

***Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)***

limits. All physical and general parameters were observed within the permissible limit as per IS10500:2012 (Second Revision). Thus, it is recommended that water be filtered and disinfected prior to be given for drinking water requirements.

3.8.6. Water Quality Index

WQI is defined as a rating reflecting the composite influence of different water quality parameters. WQI is calculated from the point of view of the suitability of water for human consumption. A quality rating scale (q_i) for each parameter is assigned by dividing its concentration in each water sample by its respective standard according to the guidelines laid down in the BIS and the result multiply by 100.

$$q_i = (C_i/S_i) \times 100$$

Where q_i is the quality rating, C_i is the concentration of each chemical parameter in each water sample in mg/l, and S_i is the Indian drinking water standard for each chemical parameter in mg/l according to the guidelines. For computing the WQI, the S_i is first determined for each chemical parameter, which is then used to determine the WQI as per the following equation

$$S_{li} = W_i \times q_i$$

$$QWI = \sum S_{li}$$

S_{li} is the sub-index of the i th parameter; q_i is the rating based on concentration of i th parameter and n is the number of parameters. The computed WQI values are classified in to five types, "excellent water" to "water not suitable for drinking".

Table 3.13 : Water Quality Classification based on WQI Value

WQI value	Water quality
<50	Excellent
50-100	Good water
100-200	Poor water
200-300	Very poor water
>300	Water not suitable for drinking

3.8.7. Ground Water Quality Index

The Water Quality Index based on weighted average of 11 parameters (Total Hardness as CaCO_3 , Calcium, Alkalinity, Chloride, Magnesium, TDS, Sulphate, Fluoride, pH, Iron, Nitrates) has been found range between Excellent to Good Water as shown in **Table 3.14**.

Table 3.14 : Ground Water Quality Index

Season	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
Oct-Dec 2021	112	57	126	66	85	99	122	107
Classification	Poor water	Good water	Poor water	Good water	Good water	Good water	Poor water	Poor water

Surface Water Quality:

Water sampling and analysis has been carried out through NABL accredited and MoEF recognized Laboratory to determine the existing baseline water quality around the project area. Pond water sample were analyzed for various parameters and assessed using the CPCB's BDU Criteria (refer **Table 3.15**). The physical, chemical and biological analysis results of the Surface water samples are presented in **Table 3.16**:

Table 3.15 : Surface Water Quality Criteria as per CPCB

Designated-Best-Use	Class of Water	Criteria
Drinking Water Source without conventional treatment but after Disinfection	A	Total Coliforms Organism MPN/100ml shall be 50 or less pH between 6.5 and 8.5 Dissolved Oxygen 6mg/l or more Biochemical Oxygen Demand 5 days 20°C 2mg/l or less
Outdoor bathing (Organized)	B	Total Coliforms Organism MPN/100ml shall be 500 or less; pH between 6.5 and 8.5; Dissolved Oxygen 5mg/l or more Biochemical Oxygen Demand 5 days 20°C 3mg/l or less
Drinking water source after conventional treatment and disinfection	C	Total Coliform Organism MPN/100ml shall be 5000 or less; pH between 6 to 9; Dissolved Oxygen 4mg/l or more Biochemical Oxygen Demand 5 days 20°C 3mg/l or less
Propagation of Wildlife and Fisheries	D	pH between 6.5 to 8.5 Dissolved Oxygen 4mg/l or more Free Ammonia (as N) 1.2 mg/l or less
Irrigation, Industrial Cooling, Controlled Waste disposal	E	pH between 6.0 to 8.5 Electrical Conductivity at 25°C micro mhos/cm Max. 2250 Sodium absorption Ratio Max. 26 Boron Max. 2mg/l
	Below E	Not Meeting A, B, C, D & E Criteria

Table 3.16 : Surface Water Quality

S.No	Parameters	Unit	SW-1	SW-2	SW-3
1	pH value	-	6.86	6.83	7.09
2	Turbidity	NTU	7	8	13
3	Conductivity	mmhos/cm	428	412	1212
4	Total Dissolved Solids	mg/l	269	258	764
5	Total Suspended solids	mg/l	11	14	18
6	Total Hardness (as CaCO ₃)	mg/l	140	138	270

7	Chlorides (as Cl)	mg/l	46	38	224
8	Total Alkalinity as CaCO ₃	mg/l	148	150	190
9	Sulphate (as SO ₄)	mg/l	5	6	8
10	Nitrate (as NO ₃)	mg/l	5.3	5.1	7.3
11	Fluoride (as F)	mg/l	0.3	0.3	0.5
12	Iron (as Fe)	mg/l	0.13	0.16	0.21
13	Zinc (as Zn)	mg/l	0.11	0.12	0.19
14	Calcium (as Ca)	mg/l	38	42	68
15	Magnesium (as Mg ²⁺)	mg/l	10.8	7.92	24
16	Sodium (as Na)	mg/l	36	34	108
17	Potassium (as K)	mg/l	3	3	12
18	Cadmium (as Cd)	mg/l	<0.01	<0.01	<0.01
19	Copper (as Cu)	mg/l	<0.05	<0.05	<0.05
20	Nickel (as Ni)	mg/l	<0.01	<0.01	<0.01
21	Lead (as Pb)	mg/l	<0.01	<0.01	<0.01
22	Mercury (as Hg)	mg/l	<0.001	<0.001	<0.001
23	Total arsenic (as As)	mg/l	<0.01	<0.01	<0.01
24	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	<0.001	<0.001	<0.001
25	Manganese as Mn	mg/l	<0.01	<0.01	<0.01
26	Cyanide as CN	mg/l	<0.05	<0.05	<0.05
27	Total Chromium (as Cr)	mg/l	<0.05	<0.05	<0.05
28	Aluminum as Al	mg/l	<0.03	<0.03	<0.03
29	Oil & Grease	mg/l	<2	<2	1.1
30	Chemical Oxygen Demand	mg/l	14	16	32
31	Bio- Chemical Oxygen Demand as BOD (for 3 Days 27 °C)	mg/l	2.6	2.8	6.2
32	Dissolved Oxygen	mg/l	7.3	7.2	6.7
33	Total Coliform	MPN/100ml	2340	2520	6450

Observation on Surface Water Quality: The Hoogly river water quality parameters are compared with BDU Criteria of CPCB. The river water quality with respect to pH, DO, BOD coliform and COD in Hoogly River in both the sampling location comply with the Class C of BDU Criteria of CPCB. The drain water quality is polluted.

3.8.8. Water Quality Index

3.8.9. Methodology for Surface Water Quality Index

The quality of surface water in an inland water body has a profound effect on the ground water table and ground water quality of the nearby aquifers due to existence of direct interaction between surface and ground water. Hence, surface water quality index has a major significance in determination of the water quality status of area. Given the parameters monitored in India under the NWMP and to maintain the uniformity while comparing the WQI across the nation, the NSF WQI has been modified and relative weights been assigned by CPCB. The modified weights as per CPCB are given in Tables below and the equations used to determine the sub index values are

given Tables below Upon determining the Water Quality Index, the water quality is described for easy understanding and interpretation.

Modified weights for computations for WQI based on DO, FC, pH, and BOD

Parameters	Original weights from NSF WQI *	Modified weights by CPCB
Dissolved Oxygen (DO)	0.17	0.31
Fecal Coliform (FC)	0.15	0.28
pH	0.12	0.22
BOD	0.1	0.19
Total	0.54	1

*National Sanitation Foundation Water Quality Index

Sub-index equation used to calculate NSF WQI for DO, FC, pH, and BOD

Water Quality Parameters (Units)	Range Applicable	Sub-equation	Sub-Index (Sub-equation x Modified Weights)
Dissolved Oxygen (DO) (%age Saturation) *	0-40	$0.18 + 0.66 \times \% \text{ Saturation DO}$	Sub-equation x 0.31
	40-100	$(-13.55) + 1.17 \times \% \text{ Saturation DO}$	
	100-140	$163.34 - 0.62 \times \% \text{ Saturation DO}$	
Fecal Coliform (FC) (Counts/100 ml)	1-10 ³	$97.2 - 26.6 \times \log \text{ FC}$	Sub-equation x 0.28
	10 ³ -10 ⁵	$42.33 - 7.75 \times \log \text{ FC}$	
	>10 ⁵	2	
pH	2-5	$16.1 + 7.35 \times (\text{pH})$	Sub-equation x 0.22
	5-7.3	$(-142.67) + 33.5 \times (\text{pH})$	
	7.3-10	$316.96 - 29.85 \times (\text{pH})$	
	10-12	$96.17 - 8.0 \times (\text{pH})$	
	<2, <12	0	
BOD (mg/l)	0-10	$96.67 - 7 \times (\text{BOD})$	Sub-equation x 0.19
	10-30	$38.9 - 1.23 \times (\text{BOD})$	
	>30	2	

***DO (Saturation %) = DO value / 6.5x100 (6.5 has been taken as constant as per DO v/s Temperature)**

Calculations for Surface Water Quality Index

$$\text{NSFWQI} = \sum_{i=1}^P W_i l_i$$

where,

l_i = sub index for water quality parameter

W_i = weight (in terms of importance) associated with water quality parameter

P = number of water quality parameters

QUALITY CLASSIFICATION OF SURFACE WATER

Table 3.17 : Water Quality Classification and Best Designated Use

WQI	Quality Classification	Class	Remarks
63-100	Good to Excellent	A	Non-Polluted
50-63	Medium to Good	B	Non-Polluted
38-50	Bad	C	Polluted
38 and less	Bad to very bad	D, E	Heavily Polluted

3.8.10. Surface Water Quality Index

The Water Quality Index based on above methodology has been found to be between **Class A to Class C** indicating Surface water quality as **Excellent to Bad**.

Table 3.18 : Surface Water Quality Index

Season	SW1	SW2	SW3
March -2022- May-2022	61.7	60.8	55.7
Quality Classification	Medium to Good	Medium to Good	Medium to Good
Class	B	B	B
Remarks	Non-Polluted	Non-Polluted	Non-Polluted

3.9. Air Environment

Under the provisions of the Air (Prevention & Control of Pollution) Act, 1981, the CPCB has notified fourth version of National Ambient Air Quality Standards (NAAQS) in 2009. Ambient air is defined as any unconfined part of the Earth's atmosphere, that the surrounding outdoor air in which humans and other organisms live and breathe.

3.9.1. Climate and Meteorology

Historical meteorological data were obtained from climatologically tables pertaining to nearest representative IMD station located at Kolkata and is presented in **Table 3.19**. As per the IMD Kolkata station, the summer begins in early March and lasts until June. April and May are the hottest months. Monsoon begins in June. October and November see the retreat of the monsoon and a return of high temperatures until late November. Winter starts in December and ends in February.

Table 3.19 : Climate Data of IMD Kolkata (1981-2010)

Month	Mean Temperature (°C)		Humidity (%)		Rainfall		Predominant Wind Direction		Wind speed (km/hr)
	Max	Min	At 8:30	At 17:30	Total (mm)	Rainy Days	At 8:30	At 17:30	

January	29.8	10.7	77	61	10.4	1.1	N,NW	N,NW	2.3
February	33.5	12.9	72	54	20.9	1.7	N,NW	N,NW	3.0
March	37.4	17.6	70	51	35.2	2.2	SW,S	S,SW	4.5
April	38.5	20.4	73	62	58.9	3.4	S,SW	S,SW	6.3
May	38.8	21.5	74	68	133.1	7	S,SW	S,SE	6.6
June	38	23.7	80	77	300.6	12.8	S,SW	S,SE	5.8
July	35.9	24.3	84	82	396	17.7	S,SW	S,SE	5.3
August	35	24.4	84	83	344.5	16.9	S,SE	S,SE	4.6
September	35.3	23.8	83	82	318.1	13.9	SE,S	S,SE	4.0
October	35.1	20.6	78	75	180.5	7.4	S,SE	S,SE	2.6
November	32.9	15.4	72	67	35.1	1.3	N,NE	NW,N	2.0
December	29.8	11.8	75	65	3.2	0.5	N,NW	N,NW	1.9
Total	39.8	10.4	77	69	1836.5	85.9	S,SW	S,SE	4.1

{Source: Indian Meteorological Department, Climatologically Tables (1981-2010)}

Temperature—Annual Average mean minimum temperature varies from 10.7°C (Jan) to 24.4°C (August) while mean maximum temperature varies from 29.8°C (Jan) to 38.8°C (May). The highest monthly average temperature is 38.8°C in May where lowest monthly average temperature is 10.7°C in the month of January. January is the coldest month.

Relative Humidity—Relative Humidity at 8:30 hr varies from 70% (March) to 84% (July & August) while at 17:30 hr it ranges from 51% (March) to 83% in (August). During the monsoon season relative humidity generally varies between 78% to 84% in the morning and 75% to 82% in the afternoon.

Rainfall—Total annual mean rainfall was observed to be 1836.5 mm. Highest monthly average rainfall is 396 mm in the month of July whereas lowest monthly average rainfall is 3.2 mm in December.

Wind Speed—The wind speed was mostly below between 1.9 to 6.6 kmph for all the months. The wind speed during summer season was mostly between 4.5 to 6.6 kmph while during rainy season, it was between 4.0 to 5.6 kmph and in winter months wind speed ranges between 1.9 to 3.0 km/hr.

Wind Direction—The wind pattern of the region shows that the predominant wind direction is S for most of the months.

3.9.2. Site Specific Meteorology

The site-specific Meteorological data was collected from Weather Monitoring Station (WMS) installed near project site. The data was collected for the month of **March, 2022 to May, 2022**. The parameters monitored at the meteorological station were

temperature, relative humidity, wind speed, wind direction. The data recorded at the site was also validated by secondary meteorological data for Kolkata IMD. Data recorded is summarized in **Table 3.20**. Windrose of summer season is shown in **Figure 3.12**. wind frequency diagram presented in **Figure 3.13**

Table 3.20 : Summary of Site-Specific Meteorological Data

Month	Temperature, °C		Humidity %		Predominant Wind direction from	Wind speed (m/s)	
	Min	Max	Min	Max		Min	Max
March 2022	17.0	36.8	51	70	S, SW	0.5	<4.0
April 2022	18.9	40.9	54	74	S, SW		
May 2022	21.1	42.2	53	70	S, SW		

(Source: WMS)

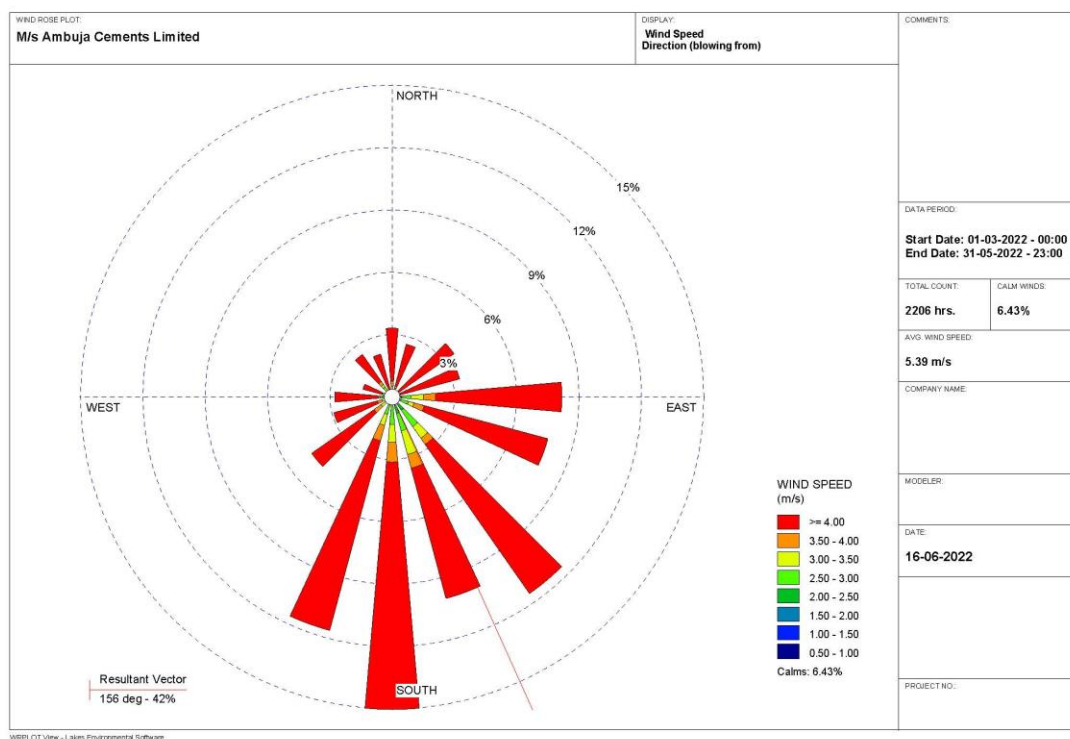


Figure 3.12 : Site-specific Windrose Diagram

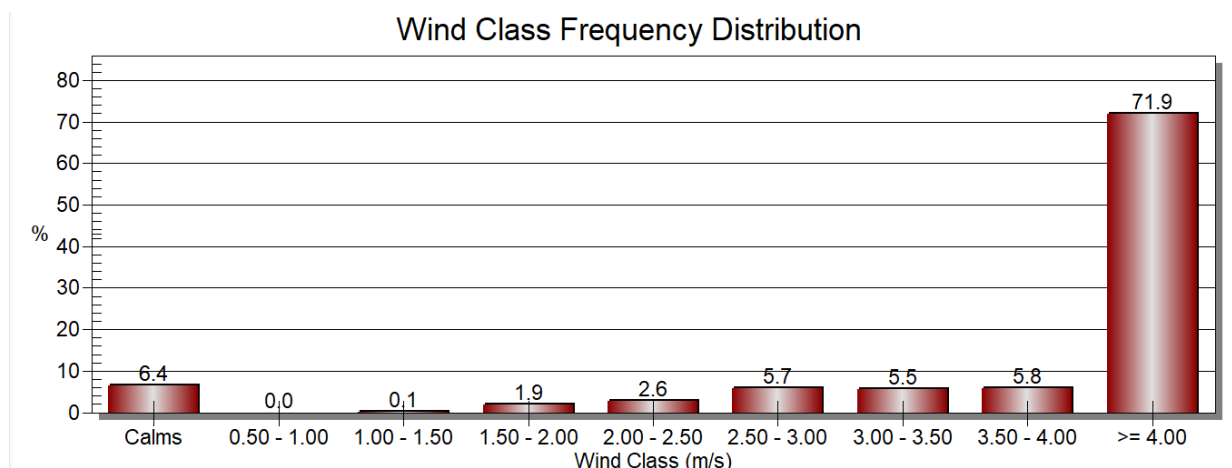


Figure 3.13 : Wind Frequency Diagram

3.10. Ambient Air Quality

Air pollution can cause significant effects on the environment and subsequently on human, animals, vegetation and materials. In most cases, air pollution aggravates pre-existing diseases or degrades health status, making people easily susceptible to other infections and development of chronic respiratory and cardiovascular diseases. Further, environmental impacts from air pollution can include acidic deposition and reduction in visibility.

The objective of the study is to analyze the existing ambient air quality within the study area and compare it with the NAAQ standards specified by CPCB to know about the pollution status of air in and around the project area. To quantify the impact of the construction activities on the ambient air quality at the construction site and its surrounding area, it is necessary to evaluate the existing ambient air quality in those areas.

3.10.1. Causes Attributing to Air Pollution in and around Project Area

The existing causes of air pollution in and around project area are due to industrial activities, vehicular movement and dust arising from unpaved roads. The project site is located close to the Jalan Industrial complex. Jalan Industrial Complex is critically polluted area by CPCB. There are many industries are operating in this industrial complex. There are about 5 Highly Polluting Industries, 86 Red Category Industries and about 120 Green Category industries located in this park. – above 120 nos. The main air emission of these units is due to burning of fossil fuel like coal and furnace oil.

3.10.2. Rationale for Selecting Monitoring Station

The baseline status of the ambient air quality has been established through a scientifically designed ambient air quality monitoring network and was based on the following considerations:

- Meteorological conditions.

- Topography of the study area.
- Representatives of regional background air quality.
- Representatives of likely impact areas within the study area; and
- Location of residential areas representing different activities.

The monitoring station were selected keeping in view the sites like High density Residential area, Jalan Industrial complex, mixed use zone in upwind of the site and downwind of the site to understand the impact of the proposed project in the downwind direction compared to upwind polluting load from the vehicular traffic emission, community activities, industrial activity, and other sources. Details of monitoring locations are shown in **Table 3.21**.

Table 3.21 : Location of Air Monitoring Stations

Station	Sampling Location	Direction from Project Site (KM)	Aerial distance in km. from boundary of Project Site	Cordinates
AAQ-1	Project Site	SITE	-	22.571632 N 88.198140 E
AAQ-2	Near Jala Dhulagori	N (Upwind)	3.0	22.588055 N 88.181251 E
AAQ-3	1 Km from Project Site near Ghoraghat	S (Downwind)	1.0	22.574060 N 88.184967 E
AAQ-4	New Saranga	S (Downwind)	6.5	22.527618 N 88.217720 E
AAQ-5	Debalpur	NW	5.4	22.593836 N 88.171823 E
AAQ-6	Jalan Industrial Complex	NE (Critical Polluted Area)	3.0	22.571612 N 88.184563 E
AAQ-7	Bhagwatipur	SW	1.6	22.566464 N 88.199261 E
AAQ-8	Sarathpalli	SE	1.7	22.561176 N 88.210518 E

Source: Monitoring Plan

3.10.3. Rationale for Selecting Monitoring Station

The ambient air quality monitoring for pollutants was done by following Guidelines for Manual Sampling and Analyses (Volume-1) issued by CPCB in May, 2011. Sampling methodology is as mentioned in **Table 3.22**. The ambient air quality monitoring was conducted during March 2022 to May 2022. Details of the sampling methodology presented in Table 3.26.

Table 3.22 : Sampling Methodology

Sampling Parameters	Standard referred	Sample Collection	Sample Analysis	Methodology
		Sampling Equipment	Analytical Equipment	
PM ₁₀	IS 5182-Part 23	Respirable Dust Sampler	Electronic Balance	Gravimetric method
PM _{2.5}	--	Fine Dust Sampler	Electronic Balance	Gravimetric method
SO ₂	IS 5182 -Part 2	RDS with impinger	Spectrophotometer	Improved West & Gaeke Method
NO _x	IS 5182 -Part 6	RDS with impinger	Spectrophotometer	Na- Arsenite Method
CO	IS 5182 -Part 10	Tadler bag	GC-FID	Chromatography

3.10.4. Monitoring Result

Summary results of ambient air quality monitoring data are shown in **Table 3.23**.

Table 3.23 : Summary of Ambient Air Quality

Location	PM ₁₀ (µg/m ³)				PM _{2.5} (µg/m ³)			
	Min	Max	Mean	98 %tile	Min	Max	Mean	98 %tile
Project Site	52.5	95.9	77.5	95.4	24.3	51.2	39.7	51.1
Near Jala Dhulagori	56.1	91.8	74.9	91.5	24.3	55.8	40.9	55.4
1 Km from Project Site near Ghoraghat	58.6	96.8	79.6	96.2	25.0	58.0	44.0	57.0
New Saranga	50.9	87.8	70.8	86.8	22.6	51.8	38.9	51.1
Debalpur	47.8	82.9	68.6	82.8	20.6	48.6	36.7	48.4
Jalan Industrial Complex	57.9	117.8	98.4	116.6	30.5	56.2	46.4	56.2
Bhagwatipur	47.8	80.7	68.6	80.5	19.2	43.5	35.0	43.4
Sarathpalli	45.8	77.9	66.5	77.8	17.7	42.9	33.7	42.3
National Standard (24 hrs)	100 µg/m³				60 µg/m³			

Table 3.21 continued

Location	SO ₂ (µg/m ³)				NO ₂ (µg/m ³)			
	Min	Max	Mean	98 %tile	Min	Max	Mean	98 %tile
Project Site	8.8	14.9	11.6	14.9	17.8	26.3	23.4	26.0

Near Jala Dhulagori	6.4	9.9	8.1	9.9	12.1	19.1	15.9	19.0
1 Km from Project Site near Ghoraghat	6.9	10.3	8.6	10.3	12.4	19.4	16.1	19.3
New Saranga	6.9	8.8	7.8	8.8	9.5	13.4	11.8	13.4
Debalpur	5.7	8.9	7.1	8.9	9.2	13.3	10.9	13.1
Jalan Industrial Complex	8.8	14.9	12.4	14.9	18.7	27.3	23.3	27.3
Bhagwatipur	6.4	9.9	11.0	9.9	16.2	24.2	21.5	24.2
Sarathpalli	6.9	10.3	7.4	10.3	9.1	15.4	11.5	14.9
National Standard (24 hrs)	80 µg/m³				80 µg/m³			

Table 3.21 continued

Location	CO(mg/m ³)			
	Min	Max	Mean	98 %tile
Project Site	0.44	0.69	0.58	0.69
Near Jala Dhulagori	0.34	0.56	0.41	0.52
1 Km from Project Site near Ghoraghat	0.36	0.58	0.46	0.58
New Saranga	0.26	0.43	0.32	0.43
Debalpur	0.25	0.42	0.32	0.39
Jalan Industrial Complex	0.43	0.78	0.60	0.75
Bhagwatipur	0.36	0.64	0.51	0.63
Sarathpalli	0.26	0.41	0.34	0.41
National Standard (8 hrs.)	2.0 mg/m³			

3.10.1. Interpretation of Results

Particulate Matter (PM₁₀): The PM₁₀ values ranges from 45.8 µg/m³ to 117.8 µg/m³ in the study area. The maximum PM₁₀ values i.e. 117.8 µg/m³ were observed to be at Jalan industrial complex (AAQ-6) located at distance of 3 Km, NE (Industrial area) and minimum i.e. 45.8 µg/m³ was observed at Sarathpalli (AAQ 8) at distance of 1.7 Km, SE. The highest pollution levels are observed in Jalan Industrial Complex (AAQ-6). In Jalan industrial complex (AAQ-6) high value are observed due to Industrial activities & vehicular traffic emission in nearby highway.

Particulate Matter (PM_{2.5}): The PM_{2.5} values ranges from 17.7 µg/m³ to 58.0 µg/m³ in the study area. The Maximum PM_{2.5} values i.e. 58.0 µg/m³ were observed to be at

Ghoraghat located at 1 km south, and minimum i.e. $17.7 \mu\text{g}/\text{m}^3$ was observed to be at Sarathpalli (AAQ 8) at distance of 1.7 Km, SE. High PM 2.5 values were recorded in Ghoraghat and Jalan industrial area but found well within the NAAQS.

Sulphur Dioxide (SO_2): The SO_2 values ranges from $5.7 \mu\text{g}/\text{m}^3$ to $14.9 \mu\text{g}/\text{m}^3$ in the study area. The maximum SO_2 values i.e., $14.9 \mu\text{g}/\text{m}^3$ were observed to be at Project Site and jalan industrial complex and the minimum SO_2 values were observed to be at Debalpur (AAQ-5, 5.4 Km, NW). The results show the values were within the NAAQS permissible limit ($80 \mu\text{g}/\text{m}^3$).

Oxides of Nitrogen (NO_x): The NO_x values range from $9.1 \mu\text{g}/\text{m}^3$ - $27.3 \mu\text{g}/\text{m}^3$ in the study area. The maximum NO_x values i.e. $27.3 \mu\text{g}/\text{m}^3$ were observed to be at Jalan industrial complex (AAQ-6) located at distance of 3 Km, NE and minimum values i.e. $9.1 \mu\text{g}/\text{m}^3$ were observed to be at Sarathpalli (AAQ 8) at distance of 1.7 Km, SE. The results show the values were within the NAAQS permissible limit ($80 \mu\text{g}/\text{m}^3$).

CO: The CO values ranges from $0.25 \text{ mg}/\text{m}^3$ - $0.78 \text{ mg}/\text{m}^3$ in the study area. The maximum CO values i.e. $0.78 \text{ mg}/\text{m}^3$ were observed to be at Jalan industrial complex (AAQ-6) located at distance of 3 Km, NE and minimum values i.e. $0.25 \mu\text{g}/\text{m}^3$ was observed to be at Debalpur (AAQ-5). The results show the values were within the NAAQS permissible limit ($4 \text{ mg}/\text{m}^3$).

3.10.2. Category of Air Quality Index

An air quality index is defined as an overall scheme that transforms the weighed values of individual air pollution related parameters (for example, pollutant concentrations) into a single number or set of numbers (Ott, 1978). The objective of an AQI is to quickly disseminate air quality information (almost in real-time) that entails the system to account for pollutants which have short-term impacts. It is equally important that most of these pollutants are measured continuously through an online monitoring network. Since in present case air quality has been monitored manually on 24- hourly twice a week basis for one season, real- time air quality information is not possible. However, the data collected over a season can significantly describe the category of air quality in corresponding period. The AQI Category for each of monitoring station has been found to be satisfactory (Table 3.24)

Table 3.24 : AQI Category for Monitoring Station

Monitoring Station	AQI	AQI Category
AAQ-1	78	Satisfactory
AAQ-2	75	Satisfactory
AAQ-3	80	Satisfactory
AAQ-4	71	Satisfactory
AAQ-5	69	Satisfactory

AAQ-6	127	Moderate
AAQ-7	69	Satisfactory
AAQ-8	66	Satisfactory

Table 3.25 : AAQ category index

Good (0–50)	Minimal Impact	Poor (201–300).	Breathing discomfort to people on prolonged exposure
Satisfactory (51–100)	Minor breathing discomfort to sensitive people	Very Poor (301–400)	Respiratory illness to the people on prolonged exposure
Moderate (101–200)	Breathing discomfort to the people with lung, heart disease, children and older adults	Severe (>401)	Respiratory effects even on healthy people

3.11. Noise Environment

Ambient Noise Level monitoring is one of the essential components of EIA study. Such assessment helps in evaluating the existing noise levels and suggesting appropriate mitigation measures to minimize the potential impact from proposed development in the projects.

3.11.1. Attributing to Noise Pollution in and around Project Area

The existing causes of ambient noise in and around project area are due to community sources, construction activities, vehicular movement, and industrial activity. The proposed expansion of project will be within the existing unit, no major installation and construction is envisaged leading to noise pollution.

3.11.2. Methodology

The noise monitoring was done on following CPCB protocol of Noise Monitoring, July 2015, which inter alia include the following cardinal principles:

- The Noise measurements shall be made with a Type 1 integrating sound level meter. The station should be located at the ambient level i.e., away from the direct source, away from any vibration and any obstruction.
- Microphone must be placed 1.2 -1.5m above the ground level.
- The instrument should be isolated from strong vibration and shock.
- The monitoring should be carried out minimum 75% of the prescribed Day time (06.00 am to 22.00 pm) and Nighttime (22.00 pm to 06.00 am).
- During ambient noise monitoring sound comes from more than one direction, it is important to choose a microphone and mounting which gives the best possible omni directional characteristics.
- Noise measurements should not be made in fog and rain.
- A wind shield will always be used to prevent interference of reflecting noise.

Noise after a certain level can have a very disturbing effect on the people and animals exposed to it. Hence, it is important to assess the present noise quality of the area to predict the potential impact of future noise levels due to the proposed project.

3.11.3. Selection Criteria for Noise Monitoring Location

An assessment of baseline noise quality was undertaken to

- (a) establish the status of exposure of the major sensitive receptors, and
- (b) to identify the noise pollution levels in and around the site.

The baseline study for noise levels in the study area has been carried out by selecting a noise monitoring station based on the following criteria

- Environmental setting of the area.
- Source of the noise.
- Proximity of the noise generating source to the human settlements.

Based on the above, noise monitoring was carried out at eight monitoring location. Details of the Monitoring location and map showing the location in the study area is as shown in **Table 3.26**.

Table 3.26 : Ambient Noise Quality Monitoring Locations

Station	Sampling Location	Direction from Project Site (KM)	Aerial distance in km. from boundary of Project Site	Cordinates
N-1	Project Site	-	-	22.571632 N 88.198140 E
N-2	Near Jala Dhulagori	N (Upwind)	3.0	22.588053 N 88.181250 E
N-3	Munshirhat-Sankrail road	Along the northern boundary of site	Along the northern boundary of site	22.574620 N 88.194344 E
N-4	Chennai-Kolkata highway	west	0.5	22.572321 N 88.184148 E
N-5	Debalpur	NW	5.4	22.593568 N 88.171507 E
N-6	Jalan Industrial Complex -I	NE (Critical Polluted Area)	3.0	22.571241 N 88.183803 E
N-7	Bhagwatipur	SW	1.6	22.566487 N 88.199326 E
N-8	Sarathpalli	SE	1.7	22.561187 N 88.210767 E

3.11.4. Result and Conclusion

Location wise result for daytime and nighttime Leq is presented in Table 3.27.

Table 3.27 : Ambient Noise Leq at Monitoring Location

Location	Classification of Area	Noise level Values Leq dB(A)		Applicable CPCB Standard Leq dB(A)	
		Day	Night	Day	Night
N1	Industrial	62.6	57.6	75	70
N2	Residential	54.2	43.9	55	45
N3	Commercial	63.8	54.9	65	55
N4	Commercial	68.9	62.3	65	55
N5	Residential	53.4	43.2	55	45
N6	Industrial	68.3	59.7	75	70
N7	Residential	52.9	42.2	55	45
N8	Residential	54.8	43.8	55	45

3.11.5. Interpretation and Inference

The noise levels observed in the project site and study area are within prescribed limits except Chennai-Kolkata highway that is mainly due to vehicle noise / traffic movement on highways. Otherwise the day time and night time noise level in study area were found within the respective prescribed standards.

3.12. Ecology and Biodiversity

The biological environment is an important component of the environment of any area. It covers flora & fauna in the region, details of forests and wildlife sanctuaries in the region, with list of endangered species. The Botanical and wildlife species in an area depend on the availability of suitable habitat for survival. Habitat loss and increasing habitat fragmentation are the primary causes of species decline in these environments. This section provides an overview of flora and fauna observed in study area (10 km area around the project site) during site visit.

Methodology: Field sampling efforts covered the proposed project site and its area of influence. One season field survey was conducted for vegetation, and wildlife. In addition, public consultations were also done in the communities around the site. A phased and consultative approach was followed to carry out ecological assessment. Successive phases of the assessment included (i) Secondary data collection through desktop review of available literature and (ii) Onsite data collection for determining vegetation and wildlife in the study area & Reconnaissance survey (iii) Public consultation.

Secondary Data Collection: An extensive desktop review of available published literature (books, websites, scientific papers, articles etc.) was conducted. The Forest Working Plans of Forest Divisions was also referred for secondary information. Additional information was sourced from the project proponent, governmental institutions and local residents of the survey-area. Literature was sourced from the govt. source like Forest department, MOEF&CC, IUCN and other related departments. Additional data sources include published articles in journals, gazettes, and technical reports, maps, internet, amongst others. The secondary data was appropriately supplemented by a field survey for primary data collection.

Primary Data Collection & Reconnaissance survey: To know the biodiversity in the study area transects walks & reconnaissance survey were conducted at different locations. As there is no reserved and protected forest present in the study area hence as per the EB protocol of EQMS no quadrat sampling was done and only line transect were laid down to know the vegetation pattern in the study area. At each vegetation sampling point, the floral diversity and species composition were noted using line transects at different sampling points. Samples of plants that could not be identified in the field were collected, pressed and carried to the herbarium for further identification. The health status of the vegetation was visually determined. Visual encounter method in combination with line transects was adopted for assessment of terrestrial wildlife during the day and at night to cover for diurnal and nocturnal animals. Binoculars were used to enable the study of birds and other far distant animals.

Public consultation: Beside above local people were also consulted during the site survey for their socio-economic status, life & livelihood.

3.12.1. Terrestrial Ecology

3.12.2. Forest/Vegetation Howrah District

Due to urbanization and industrial activities, there is no forest present in the Howrah district. The study area does not have any kind of the forest. The type of Forest presented in West Bengal is presented in **Table 3.28** Below:

Table 3.28 : Type of Forest present in Howrah District

Circle	Reserve forest (km²)	Protected Forest (km²)	Unclassed state Forest (km²)	Total Area (km²)
Howrah District	0	0	0	0
West Bengal	7054	3772	1053	11879

Source: Annual Report 2015-2015

3.12.3. Critical Environmental Resources in Project Study Area

The study area is primarily comprising of Jalan Industrial complex, surrounding industrial area, Howrah commercial zone with majority of residential areas. River Hooghly flowing

about 4 km south of the proposed project site. There is very scattered vegetation cover in and around project sites. There is no reserved forest and protected forest present within 10 km area of the project site. Project site as well as the 10 km radius area of the proposed site does not support any critical habitat, like Biosphere Reserves, Wildlife Sanctuaries, National Parks, Tiger Reserves, Important bird area, bird sanctuary, migratory bird's habitat, migratory route of animals, wetland etc.

3.12.4. Vegetation Type in Study Area (10 km study Area)

The study area is primarily comprising of industrial zone, commercial and residential zones. The vegetation in the study area mainly in the form of green belt developed by the industries, Plantation done along the roadside by Municipality and scared vegetation along the agriculture fields. The status of ecological health of the impact zone is discussed under the following:

3.12.5. Terrestrial Ecology

The terrestrial ecology within the whole impact zone is discussed as under:

Flora in Core Zone: The 2 km area around the proposed project site is considered as the core zone. The proposed site is located at village: Jala Dhulagori, Sankrail. The most of the activities around the project site is industrial and commercial. The vegetation is restricted to road side plantation, open spaces and plantation done by the industries under green belt development programme. The dominant vegetation type in core zone comprises of trees like *Albizia lebbbeck*, *Casuarina equisetifolia*, *Casia fistula*, *Delonix regia*, *Acacia spp*, *Azadirachta indica*, *Delbergisisso* etc.

Herb & shrubby species including riparian vegetation are *Xanthium strumarium*, *Nerium indicum*, *Parthenium spp*, *Calotropis procera*, *Lantana camara*, *Casiatora*, *Vitex negundo*, *Zizyphus mauritiana*, *Canabis sativa*, *Argemonmaxicana*, *Sida spp*. and few grasses species.

Flora of Buffer zone (10 km area) Terrestrial flora of the buffer zone includes open scrub land, crop land having agrarian ecosystem and roadside plantation. Most of the land within the 10 km area of the proposed site is under residential and commercial activities. The vegetation type observed in study area is discussed in following sections.

Open Scrub Land: There is very less land area is under scrub vegetation. The vegetation is dominated by shrubs and herbs characterised by vegetation dominated by shrubs, often also including grasses, herbs, and geophytes. Shrubland may either occur naturally or be the result of human activity. It may be the mature vegetation type in a particular region and remain stable over time, or a transitional community that occurs temporarily as the result of a disturbance. The vegetation is dominated by shrubby species like *Acacia nilotica*, *Acacia auriculiformis* along with *Xanthium strumarium*, *Ricinus communes*, *Nerium indicum*, *Calotropis procera*, *Lantana camara*, *Casiatora*, *Vitex negundo*, *Zizyphus mauritiana*, *Daturametel*, *Solanumsuratensis*, *Ipomea cornia*, *Canabis sativa*, *Parthenium grass* (exotic species), *Argemonmaxicana* and few grasses species.

Agarian Ecosystem: The study area is almost flat and part of the study area is under cultivation and hence, belong to agrarian ecosystem. Agro ecosystem is defined as a spatially and functionally coherent unit of agricultural activity and the living and non-living components involved in that unit as well as their interactions. The vegetation in this type of ecosystem is restricted to along the sides of the agricultural field and approach paths to the fields.

The major portion of this buffer zone comes under this category of ecosystem which spans all along the road site, parks and also around villages. *Acacia spp*, *Cocus nucifera*, *Phoenix sylvestris*, *Azadirachta indica*, *Albizia lebbeck*, *Delbergisisso*, *Casia fistula* and *Delonix regia* trees are predominantly observed spanning over part of this buffer zone.

The herb & shrubby species such as *Xanthium strumarium*, *Ricinus communes*, *Narium indicum*, *Calotropis procera*, *Lantana camara*, *Casiatora*, *Vitex negundo*, *Zizyphus mauritiana*, *Daturametel*, *Solanumsuratensis*, *Ipomea cornia*, *Canabis sativa*, *Parthenium* grass (exotic species), *Argemonmaxicana* and few grasses species. The list of trees, shrubs and herbs, grasses reported in the study are is presented in **Table 3.29** and **Table 3.30** below:

Table 3.29 : List of Flora reported in Study Area (trees and Shrubs)

SIN	ScientificName	Common/local Name	Family	Cor	Buffer
Trees					
1.	<i>Acacia nilotica</i>	Babul	Mimosaceae	+	+
2.	<i>Acacia auriculiformis</i>	Akasmoni	Mimosaceae	-	+
3.	<i>Albizia lebbek</i>	Siris	Mimosaceae	+	+
4.	<i>Anacardium occidentale</i>	Cashewnut	Anacardiaceae		+
5.	<i>Arecacatechu</i>	Betelnutpalm	Palmae	+	+
6.	<i>Anthocephalus kadamb</i>	Kadamb	Rubiaceae	+	+
7.	<i>Artocarpus integrifolia</i>	Jackfruit	Moraceae	-	+
8.	<i>Bauhinia accuminata</i>	Camel's foot tree	Caesalpiniae	-	+
9.	<i>Bombax malabaricum</i>	Red Silk Cotton Tree	Bombacaceae	+	+
10.	<i>Borassus flabellifer</i>	Plamyr palm	Palmae	+	+
11.	<i>Callistemon speciosus</i>	Bottlebrush tree	Myrtaceae	+	+
12.	<i>Cassia fistula</i>	Indian Laburnum	Caesalpiniae	+	+
13.	<i>Cassia siamea</i>	Chakunda	Caesalpiniae	-	+
14.	<i>Casuarina equisetifolia</i>	Jhau	Casuarinaceae	+	+
15.	<i>Cocos nucifera</i>	Coconut palm	Palmae	+	+
16.	<i>Dalbergia sissoo</i>	Sishu	Fabaceae	+	+
17.	<i>Delonix regia</i>	Gulmohar	Caesalpiniae	+	+
18.	<i>Eriodendron anfractuos</i>	White Silk Cotton Tree	Bombacaceae	-	+
19.	<i>Erythrina indica</i>	Coral tree	Fabaceae	-	+
20.	<i>Eucalyptus globules</i>	Eucalyptus	Myrtaceae	+	+
21.	<i>Exocaria agallocha</i>	Geanoa	Euphorbaceae	-	+
22.	<i>Ficus bengalensis</i>	Banyan	Moraceae	+	+

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

23.	<i>Ficus cunia</i>	Fig tree	Moraceae	+	+
24.	<i>Ficus religiosa</i>	Peepal	Moraceae	+	+
25.	<i>Gliricidia sepium</i>	gliricidia	Fabaceae	-	+
26.	<i>Holoptelea integrifolia</i>	Indian elm	Ulmaceae	+	+
27.	<i>Mangifera indica</i>	Mango	Anacardiaceae	+	+
28.	<i>Morus indica</i>	Mulberry	Moraceae	+	+
29.	<i>Peltophorum inerme</i>	Radhachura	Caesalpiniae	-	+
30.	<i>Phoenix sylvestris</i>	Date palm	Palmae	+	+
31.	<i>Pithecolobium dulce</i>	Manila tamarind	Mimosaceae	-	+
32.	<i>Pongamia pinnata</i>	Karang	Fabaceae	+	+
33.	<i>Samanea saman</i>	Raintree	Mimosaceae	-	+
34.	<i>Saraca indica</i>	Ashok	Caesalpiniae	+	+
35.	<i>Sesbania grandiflora</i>	Bakful	Fabaceae	-	+
36.	<i>Syzygium cumini</i>	Jam	Myrtaceae	+	+
37.	<i>Tamarindus indica</i>	Tamarind	Caesalpiniae	+	+
38.	<i>Tamarix dioica</i>	Nona Jhau	Euphorbiaceae	-	+
39.	<i>Trema orientalis</i>	charcoal tree	Ulmaceae	-	+
40.	<i>Trewia nudiflora</i>	Pituli	Euphorbiaceae	-	+
41.	<i>Michelia champaca</i>	Champak	Magnoliaceae	+	
42.	<i>Polyalthia longifolia</i>	Debdaru	Anonaceae	+	+
43.	<i>Pithecolobium dulce</i>	Jungle jalebi	Mimosaceae	+	+
44.	<i>Aegle marmelos</i>	Wood apple	Rutaceae	-	+
45.	<i>Feronia elephantum</i>	Elephant apple	Rutaceae	-	+
46.	<i>Azadirachta indica</i>	Neem	Meliaceae	+	+
47.	<i>Swietenia mahogany</i>	Mahogany	Meliaceae	-	+
48.	<i>Grewia asiatica</i>	Pharsa	Tiliaceae	-	+
49.	<i>Thespesia populnea</i>	Tulip tree	Malvaceae	-	+
50.	<i>Pterospermum acerifolium</i>	Muchkund	Sterculiaceae	-	+
51.	<i>Calophyllum inophyllum</i>	-	Clusiaceae	-	+
52.	<i>Lagerstroemia parviflora</i>	Jarul	Lythraceae	-	+
53.	<i>Terminalia catappa</i>	Indian Almond	Combretaceae	-	+

Shrubs

1.	<i>Abrus precatorius</i>	-	Malvaceae	-	+
2.	<i>Abutilon indicum</i>	Indian Mallow	Malvaceae	+	+
3.	<i>Acanthus illicifolius</i>	-	Acanthaceae	-	+
4.	<i>Adhatoda vasica</i>	Basaka	Acanthaceae	+	+
5.	<i>Ananas squamosa</i>	Custard apple	Anonaceae	-	+
6.	<i>Barleria prionitis</i>	-	Acanthaceae	-	+
7.	<i>Bougainvillea spectabilis</i>	Bangabilas	Nyctaginaceae	+	+
8.	<i>Calotropis procera</i>	Akando	Asclepiadaceae	+	+
9.	<i>Capparis spinosa</i>	-	Capparidaceae	-	+
10.	<i>Cestrum diurnum</i>	-	Solanaceae	-	+
11.	<i>Clerodendron inerme</i>	Ghetu	Verbanaceae	+	+
12.	<i>Clerodendron infortunatum</i>	Gaestri	Verbanaceae	-	+
13.	<i>Crotalaria alata</i>	-	Fabaceae	-	+

14.	<i>Daturametel</i>	Dhutura	Solanaceae	-	+
15.	<i>Durantaplumier</i>	-	Vervanaceae	-	+
16.	<i>Euphorbiatrilobata</i>	-	Euphorbaceae	+	+
17.	<i>Glycosmispentaphylla</i>	-	Rutaceae	-	+
18.	<i>Hibiscussubderifa</i>	-	Malvaceae	+	+
19.	<i>Hyptissuaveolens</i>	Bantulsi	Labiatae	-	+
20.	<i>Ipomeafistulosa</i>	Berakalmi	Convolvulacea	+	+
21.	<i>Ixoracoccinea</i>	Rangan	Rubiaceae	+	+
22.	<i>Jatrophagossypifolia</i>	-	Euphorbaceae	-	+
23.	<i>Lantanacamara</i>	-	Vervanaceae	+	+
24.	<i>Leonurussibiricus</i>	Motherwort	Labiatae	+	+
25.	<i>Lippiajeminata</i>	-	Verbanaceae	-	+
26.	<i>Murayaexotica</i>	Kamini	Rutaceae	-	+
27.	<i>Nyctanthasarbortristis</i>	Siuli	Apocyanacea	+	+
28.	<i>Phyllanthusemblicus</i>	Amlaki	Euphorbaceae	-	+
29.	<i>Pluchiaindica</i>	-	Compositae	-	+
30.	<i>Ricinuscommunis</i>	Castorbean	Euphorbiaceae	-	+
31.	<i>Solanumsuratensis</i>	-	Solanaceae	+	+
32.	<i>Tecomastans</i>	yellowtrumpetbu	Bignoniaceae	-	+
33.	<i>Vitexnegundo</i>	Nisenda	Vervanaceae	+	+
34.	<i>Zizyphusspp.</i>	Kul	Rhamnaceae	+	+

Table 3.30 : List of Flora (Herbs, Climbers & Grasses) in Study Area

SINo	ScientificName	Family	Core	Buffer
Herbs Climbers and Grasses				
1.	<i>Achyranthesaspera</i>	Amaranthaceae	+	+
2.	<i>Ageratumconyzoides</i>	Compositae	-	+
3.	<i>Amaranthusspinosa</i>	Amaranthaceae	+	+
4.	<i>Andrographispaniculata</i>	Acanthaceae	-	+
5.	<i>Argemonemaxicana</i>	Papavaraceae	+	+
6.	<i>Boerhaaviarepens</i>	Nyctaginaceae	+	+
7.	<i>Cassiatora</i>	Caesalpinae	+	+
8.	<i>Chenopodiumalbum</i>	Chenopodiaceae	+	+
9.	<i>Cleomeviscose</i>	Capparidaceae	-	+
10.	<i>Crotonbonplandianum</i>	Euphorbiaceae	-	+
11.	<i>Cynodondactylon</i>	Poaceae	+	+
12.	<i>Cyperusrotundus</i>	Cyperaceae	+	+
13.	<i>Desmodiumgyrans</i>	Fabaceae	-	+
14.	<i>Ecliptaalba</i>	Compositae	-	+
15.	<i>Fluryainterepta</i>	Urticaceae	-	+
16.	<i>Ipomeaquamoclit</i>	Convolvulaceae	+	+
17.	<i>Justiceagrandarusa</i>	Acanthaceae	-	+
18.	<i>Justiciasimplex</i>	Acanthaceae	+	+
19.	<i>Leucasaspera</i>	Labiatae	-	+

20.	<i>Nicotianaplumbajinifolia</i>	Solanaceae	-	+
21.	<i>Ocimumsanctum</i>	Labiatae	-	+
22.	<i>Oxalisconiculata</i>	Oxalidaceae	+	+
23.	<i>Partheniumhysterophorus</i>	Compositae	+	+
24.	<i>Pennisetumtyphoides</i>	Poaceae	-	+
25.	<i>Polygonumbarbatum</i>	Polygonaceae	+	+
26.	<i>Saccharumspontaneum</i>	Poaceae	+	+
27.	<i>Setariaglauca</i>	Poaceae	-	+
28.	<i>Sidacordifolia</i>	Malvaceae	+	+
29.	<i>Solanumnigrum</i>	Solanaceae	+	+
30.	<i>Solanumtrilobatum</i>	Solanaceae	-	+
31.	<i>Tridaxprocumbens</i>	Compositae	+	+
32.	<i>Triumfettarhomboidea</i>	Tiliaceae	-	+
33.	<i>Vincarosea</i>	Apocynaceae	+	+
34.	<i>Xanthiumstrumarium</i>	Compositae	+	+

Note: + denotes present and – denotes absent

3.12.6. Plantation in the study area:

Among various activities, planned afforestation in and around project area was already taken up under green belt development by different Industrial units. The list of species planted so far is given in **Table 3.31**. Similar plantations were also done by various panchayats in study area.

Table 3.31 : List of Plant species used for Plantation in study area

SINo	ScientificName	CommonName
A) Flowering, ornamental and Timber trees:		
1.	<i>Albizialebeck</i>	Siris
2.	<i>Alstoniascholaris</i>	Indian devil tree
3.	<i>Anthocephaluscadamba</i>	Kadam
4.	<i>Artocarpusincisa</i>	Breadfruit
5.	<i>Bauhinia purpurea</i>	Purple camel's foot
6.	<i>Callistemon lanceolatus</i>	-
7.	<i>Cassia fistula</i>	Golden shower tree
8.	<i>Casuarinaeuisetifolia</i>	She-Oak
9.	<i>Dalbergiasissoo</i>	Sishu
10.	<i>Ficus elastic</i>	Rubber plant
11.	<i>Grevillea robusta</i>	Silky-Oak
12.	<i>Lagerstroemia flos reginae</i>	-
13.	<i>Millingtonia hortensis</i>	Indian cork tree
14.	<i>Mimusops elengi</i>	Bakul
15.	<i>Polyalthia longifolia</i> Var <i>perdula</i>	Debdaru
16.	<i>Tectona grandis</i>	Teak
17.	<i>Peltophorum ferrugineum</i>	-
18.	<i>Tebe buia chrysantha</i>	Araguaney
19.	<i>Pithecolobium saman</i>	Belati Siris
20.	<i>Swietenia macrophylla</i>	Big leaf Mahogany

B) Flowering and Ornamental Shrubs:		
21	<i>Allamandaneriifolia</i>	Yellowbell
22	<i>Brunfelsiaamericana</i>	Ladyofthenight
23	<i>Bryaebenus</i>	Jamaicanraintree
24	<i>Calliandrainaequilatera</i>	-
25	<i>Cassiabiflora</i>	-
26	<i>Cestrumdiurnum</i>	DinKaRaja
27	<i>Codiaeumvariegatum</i>	Gardencroton
28	<i>Gardeniaflorida</i>	-
29	<i>Hibiscusrosasinensis</i>	Chinarose
30	<i>Jasminiurnaureiculatum</i>	Jasmine
31	<i>Jatrophamultifida</i>	Coralplant
32	<i>Juniperussp.</i>	Juniper
33	<i>Lagerstroemiaindica</i>	-
34	<i>Murayaexotica</i>	Madhukamini
35	<i>Mussaendaphilipica</i>	-
36	<i>Neriumoleander</i>	Oleander
37	<i>Nyctanthesarbortritis</i>	Shiuli
38	<i>Petreaarborea</i>	Sandpapervine
39	<i>Poinsettiapulcherrima</i>	Poinsettia
40	<i>Tabernaemontanacoronaria</i>	-
41	<i>Tecomagaudichaudi</i>	-
42	<i>Thujacompacta</i>	-
43	<i>Ixoracoccinea</i>	Jungleflame

3.12.7. Rare/Endangered/Threatened (RET) Plants

The listed as well as observed floral species has been cross-checked with the Red Data Book of Indian Plants (Botanical Survey of India). No extinct, endangered, vulnerable, rare and/or critical floral species has been found in the core zone and buffer impact zone of the study area.

3.12.8. Faunal Biodiversity

Due to industrialization and population pressure, there is neither any forest in the area nor any land designated in the revenue records as forest. Early revenue records of the area reveal that natural forest had become totally depleted. The area, at present, does not contain any type of forest. No national park(s), sanctuary, Elephant / Tiger Reserve (existing or proposed), migratory routes/ wildlife corridor exist in study area. However, some stray species of trees, shrubs and herbs, occur here and there, representing the last vestiges of the natural vegetation of the region. The early records of the faunal history of the region indicate that the diversity of wildlife was comparatively poor.

Fauna in Core Zone (2km Zone): No Reserved/ Protected and other forest land are present within 2 km area of the proposed site. The 2 km area around the site is only urban area. At present, there is hardly any wildlife left in the area. Mammals, rarely sighted in the area the other fauna that can rarely see are Mongoose and reptiles.

However, avifauna diversity is good due to presence of green belt and water bodied in the area. The wild fauna present in core zone is presented in **Table 3.32 to 3.34**.

Table 3.32 : Mammals Observed within Core Zone

	Local Name	Common Name	Scientific Name	Feeding Status	Schedule
1.	Gilahri	Striped squirrel	<i>Funambulus pennant</i>	H	IV
2.	Chuha	Field rat	<i>Bandicotabangalensis</i>	H	V
3.	Nevala	Mongoose	<i>Herpestesedwardsi</i>	C	IV

H – Herbivorous, C – Carnivorous, O – Omnivorous

Table 3.33 : Amphibians and Reptiles Observed within Core Zone

	Species	Common English	Feeding Status	Schedule
2	<i>Hemidactylus flaviviridis</i>	Northern house gecko	C	IV
3	<i>Naja kouthia</i> (Linn.)	Monocled Cobra	C	II
4	<i>Ptyas mucosus</i> (Linn.)	Common Rat Snake	C	II
6	<i>Viper russelli</i> (Shaw)	Russell's Viper	C	II

C – Carnivorous

Table 3.34 : Avifauna Observed within Core Zone

S.No.	Location Name	Dominant Species	
		Common Name	Scientific Name
1.	Near project site	<ul style="list-style-type: none"> • Little Cormorant • Grey Heron • Indian Pond Heron • Shikra • House Crow • Black Drongo • Greater Coucal • Common Myna • Indian Robin • Cattle Egret • Lapwing 	<ul style="list-style-type: none"> • <i>Phalacrocorax niger</i> • <i>Ardeacinerea Linnaeus</i> • <i>Ardeolagrayii</i> • <i>Anastomus oscitans</i> • <i>Corvus splendens</i> • <i>Dicrurus macrocerus</i> • <i>Centropus sinensis</i> • <i>Acridotheres tristis</i> • <i>Saxicoloides fulvicata</i> • <i>Bubulcus ibis</i> • <i>Venetulus indicus</i>

A. Fauna in Buffer Zone

The wild fauna present in the area is restricted to commonly found wild fauna. List of fauna found in the study area is presented in **Table 3.35** and **Table 3.36**. Among the

reptiles, snakes and lizards are most common. Several snake species were seen in the study area mostly in the paddy fields. Since there is no forest in study area, wild animals in the study area are rare. Only a few wild animals like jungle cat, fox and monkey could be seen occasionally in the study area occasionally.

Table 3.35 : List of the Mammals observed in Buffer Zone

	Local Name	Common Name	Scientific Name	Feeding Status	Schedule
1.	Lomdi	Fox	<i>Vulpes bengalensis</i>	C	II
2.	Gilahri	Striped squirrel	<i>Funambulus pennanti</i>	H	IV
3.	Chuha	Field rat	<i>Bandicotabangalensis</i>	H	V
6.	Jangli Billi	Jungle cat	<i>Felis chaus</i>	C	II
7.	Nevala	Mongoose	<i>Herpestesedwardsi</i>	C	IV
8.	Oodvilav	Otter	<i>LuteraParspicillata</i>	C	IV
10.	Monkey	Rhesus macaque	<i>Macaca mulatto</i>	H	III
11.	Chamgadad	fruit bat	<i>Cynopterus sphinx</i>	C	V

H – Herbivorous, C – Carnivorous, O – Omnivorous

Table 3.36 : List of Amphibians and Reptiles observed in Study Area

	Common Name	Scientific Name	Vernacular Name	Family	Feeding Status	Schedule
Amphibians						
	Common field Frog	<i>Rana limnocharis</i>	-	-	C	IV
	Indian bull frog	<i>Hoplobatrachustigerinus</i>	-	-	C	IV
	Common Indian Toad	<i>Bufo melanostictus</i>			C	IV
Reptiles						
	Common Rat Snake	<i>Ptyas mucosus</i> (Linn.)	-	Crotalidae	C	↓ V
	Russell's Viper	<i>Viperarusselli</i> (Shaw)	Daboia	Viperidae	C	↓ V
	Common Indian Krait	<i>Bungarus caeruleus</i>	Krait	Elapidae	C	↓ V
	Banded Krait	<i>Bungarus fasciatus</i>	-	Elapidae	C	↓ V
	House gecko	<i>Hemidactylus flaviviridis</i>	-	Gekkonidae	C	↓ V

Common Garden lizard	<i>Calotes versicolor</i>	-	Agamidae	C	IV
----------------------	---------------------------	---	----------	---	----

C – Carnivorous

3.12.8.2 Avi-fauna

Avifauna is an important part of the ecosystem playing the various roles as scavengers, pollinators, predators of insect, pest, etc. They are also one of the bio indicators of different status of environment and affected by urbanization, industrialization and human interference. They can be used as sensitive indicators of pollution and malfunction of ecosystem. List of bird species observed in the stud area is given in **Table 3.37**.

Table 3.37 : List of the Birds observed in the Study Area

Sl.No	ScientificName	CommonName	Occurrence	FoodHabit	Schedule
1	<i>Phalacrocorax niger</i>	LittleCormorant	Common	Pisivore	IV
2	<i>Nycticorax nycticorax</i>	Nightheron	Common	Insectivore	IV
3	<i>Ardeacinerea Linnaeus</i>	GreyHeron	Common	Carnivore	IV
4	<i>Ardeolagrayii</i>	IndianPondHeron	Common	InsectandFish	IV
5	<i>Bubulcus ibis</i>	Cattleegret	Common	Insects	IV
6	<i>Casmerodius albus</i>	LargeEgret	Common	Pisivore	IV
7	<i>Mesophoyx intermedia</i>	MedianEgret	Common	Pisivore	IV
8	<i>Egretta garzetta</i>	Littleegret	Common	Pisivore	
9	<i>Anastomus oscitans</i>	AsianOpenbillStork	Common	Molluscs	IV
10	<i>Theskiornis melanocephalus</i>	BlackHeadedIbis	Occasional	InsectsPrimarily	IV
11	<i>Accipiter badius</i>	Shikra	Common	Carnivore	IV
12	<i>Amaurornis phoenicurus</i>	waterhen	Common	Insectivore	IV
13	<i>Vanellus indicus</i>	Red-wattledLapwing	Common	Insectivore	IV
14	<i>Pluvialis squatarola</i>	GreyPlover	Winter Migrant	Carnivore	IV
15	<i>Columba livia</i>	BlueRockPigeon	Common	Omnivore	IV
16	<i>Streptopelia decora</i>	EurasianCollared Dove	Common	Omnivore	IV
17	<i>Streptopelia chinensis</i>	SpottedDove	Common	Omnivore	IV
18	<i>Psittacula krameri</i>	Rose-ringedParakeet	Common	Frugivore	IV
19	<i>Eudynamis scolopacea</i>	Koel	Common	Insectivore	IV
20	<i>Centropus sinensis</i>	Coucal	Common	Insectivore	IV
21	<i>Athene brama</i>	SpottedOwlet	Common	Carnivore	IV
22	<i>Apus affinis</i>	HouseSwift	Common	Insectivore	IV
23	<i>Cypsiurus balasensis</i>	AsianPalm-Swift	Common	Insectivore	IV
24	<i>Hylacons myrmenis</i>	White-breasted kingfisher	Common	Pisivore	IV
25	<i>Halcyon capensis</i>	Stork-billed Kingfisher	Common	Pisivore	IV
26	<i>Ploceus philippinus</i>	Blue-tailedBeeEater	Common	Insectivore	IV
27	<i>Merops orientalis</i>	SmallBee-eater	Common	Insectivore	IV
28	<i>Coracias benghalensis</i>	IndianRoller	Common	Insectivore	IV

29	<i>Megalaima asiatica</i>	Bluethroated Barbet	Common	Omnivore	IV
30	<i>Megalaima haemacephala</i>	Crimson-breasted Barbet	Common	Omnivore	IV
31	<i>Dinopium benghalensis</i>	Lesser Golden-backed Woodpecker	Common	Insectivore	IV
32	<i>Oriolus xanthornus</i>	Black-headed Oriole	Common	Omnivore	IV
33	<i>Dicrurus macrocercus</i>	Black Drongo	Common	Insectivore	IV
34	<i>Sturnus contra</i>	Asian Pied Starling	Common	Omnivore	IV
35	<i>Acridothera tristis</i>	Common Myna	Common	Omnivore	IV
36	<i>Dendrocitta vagabunda</i>	Rufous Tree Pie	Common	Omnivore	IV
37	<i>Corvus splendens</i>	House Crow	Common	Insectivore	IV
38	<i>Corvus macrorhynchos</i>	Large-billed Crow	Common	Insectivore	IV
39	<i>Pycnonotus cafer</i>	Red-vented Bulbul	Common	Omnivore	IV
40	<i>Pycnonotus jocosus</i>	Red-whiskered Bulbul	Common	Insectivore	IV
41	<i>Turdoides striatus</i>	Jungle Babbler	Common	Insectivore	IV
42	<i>Ficedula parva</i>	Red-Throated Flycatcher	Winter Migrant	Insectivore	IV
43	<i>Orthotomus sutorius</i>	Common Tailorbird	Common	Insectivore	IV
44	<i>Acrocephalus dumetorum</i>	Blyth's Reed-Warbler	Winter Migrant	Insectivore	IV
45	<i>Parus major</i>	Great Tit	Common	Insectivore	IV
46	<i>Dicaeum erythrorhynchos</i>	Pale-billed Flowerpecker	Common	Nectarivore	IV
47	<i>Nectarinia zeylonica</i>	Purple-rumped Sunbird	Common	Nectarivore	IV
48	<i>Nectarinia asiatica</i>	Purple Sunbird	Common	Nectarivore	IV
49	<i>Passer domesticus</i>	House Sparrow	Common	Omnivore	IV

3.12.8.3 Rare/Endangered/Threatened (RET) Fauna

The listed as well as observed faunal species has been cross-checked with the Red Data Book of Indian Animals (Zoological Survey of India). No extinct, endangered, vulnerable, rare and/or critical faunal species has been found in the core zone and buffer impact zone of the study area.

3.13. Socio-Economic Environment

As per the census records 2011, the total population was recorded as 893958 persons of 43 revenue villages/ 53 town in Howrah and Kolkatta districts in West Bengal. All study area revenue villages/Towns are under Tehsils namely Sankrail Panchla Domjurulluberia-II, Jagatballavpur, Shyampur-I. Total number of 'Households' was observed as 185533 in the study area. Male-Female wise total population in the study area was recorded as 459612 males and 434346 females respectively. Male-Female wise population breakup of the entire study area is shown in **Table 3.38**.

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

Table 3.38 : Population Distribution in the 10 km Radius Study Area

No of Households	No of House holds	Total Population	Total Male Population	Total Female Population	Total Male Scheduled Castes Population	Total Female Scheduled Castes Population	Total Male Scheduled Tribes	Total Female Scheduled Tribes
ChaturBhujkathi	525	2489	1261	1228	981	956	1	2
Dhulagari (CT)	4601	23740	12304	11436	4115	3891	2	5
Jala Dhulagiri	168	779	396	383	177	190	22	26
Sulati	736	3555	1883	1672	46	47	0	0
Sandhipur	576	2478	1261	1217	71	65	0	0
Bhagabatipur	693	3087	1591	1496	1519	1426	0	0
Dadpur	406	1759	876	883	573	559	0	0
Ghoraghat	452	1987	1004	983	609	562	4	3
Alampur	1063	4188	2182	2006	423	462	5	3
Jangalpur	418	1902	991	911	336	361	3	2
Mahishgot	532	2313	1140	1173	1109	1140	0	0
Nabghara (CT)	1238	5875	2990	2885	908	892	3	3
Manoharpur	740	3066	1564	1502	1229	1172	1	0
Sarenga (CT)	5438	25200	12798	12402	4135	3837	3	7
Kanyamani	752	3574	1839	1735	446	435	0	0
Manikpur (CT)	4478	19804	10392	9412	3159	2817	29	33
Osmanpur (CT)	1096	5289	2649	2640	737	771	0	0
Mirjapur (CT)	1239	5114	2634	2480	259	257	23	28
Argari (CT)	2209	10715	5555	5160	628	588	5	6
Masila (CT)	3059	12239	6260	5979	860	808	4	3
Ramchandrapur (CT)	2430	10312	5284	5028	577	550	0	6
Jhorhat (CT)	4298	16940	8655	8285	2067	1962	53	62

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori,Tehsil-Sankrail,
District-Howrah (West Bengal)by M/s. Ambuja Cements Limited (Unit: Sankrail)**

Hatgachha (CT)	1507	5980	3086	2894	675	646	43	45
Andul (CT)	1652	6302	3182	3120	299	291	3	2
Ula (CT)	1508	6738	3433	3305	1588	1533	1	1
Betiari	612	2633	1330	1303	1056	1010	0	2
Raghudebbati (CT)	2914	14165	7215	6950	1681	1614	37	31
Nalpur (CT)	1451	6911	3470	3441	762	740	0	1
Deulpur (CT)	2824	12618	6464	6154	648	691	6	0
Kusadanga (CT)	939	5434	2792	2642	67	55	0	0
Paniara (CT)	1496	7787	3961	3826	671	660	3	2
Bikihakola (CT)	2836	14540	7517	7023	1153	1092	2	2
Kulai	670	3727	1927	1800	90	86	0	0
Satgharia	94	451	243	208	1	1	0	0
Dhamsa	768	3067	1545	1522	184	175	1	2
Belkulai	824	3580	1858	1722	786	736	0	0
Dhunki (CT)	1846	9784	5075	4709	2068	1960	0	0
Gabberia (CT)	1092	5823	2988	2835	382	341	0	0
Paschim Panchla (CT)	1275	6951	3551	3400	230	198	0	0
Jala Bishwanathpur	1873	8569	4460	4109	1828	1716	0	0
Dakshin Panchla	499	2564	1307	1257	94	91	0	0
Sahapur (CT)	1896	9022	4675	4347	623	622	24	20
Shuvararah (CT)	3006	14330	7347	6983	1633	1533	0	0
Jujarsaha (CT)	4553	21820	11012	10808	639	625	0	0
Khasjalalsi (CT)	1114	5111	2622	2489	175	187	0	0
Ranihati	936	4662	2380	2282	606	569	4	0
Gondalpara (CT)	1009	4474	2275	2199	0	40	0	0
Beldubi (CT)	2212	10871	5568	5303	2119	2015	0	0
Baniara (CT)	1215	5476	2815	2661	1122	1088	2	4
Mahiari (CT)	4398	18223	9209	9014	1439	1393	15	18

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

Amre	251	1136	572	564	391	395	0	0
Oadipur (CT)	1153	5002	2589	2413	129	135	1	0
Rajapur	670	3209	1589	1620	1325	1397	7	3
Baigachhi	102	394	182	212	15	10	0	0
Uttar Jhapardaha (CT) WARD NO.-0001	2064	8425	4177	4248	602	611	1	1
Khantora (CT)	1531	6547	3331	3216	518	470	1	1
Natibpur (CT)	1236	7212	3663	3549	6	7	1	0
Kalara (CT)	5089	27210	14102	13108	1101	1066	9	8
Kesabpur (CT)	2510	12073	6130	5943	1098	1081	1	0
Dafarpur (CT)	1424	5461	2678	2783	197	202	1	1
Pairatangi	387	2061	1028	1033	0	0	0	0
Dharsha	266	950	429	521	0	0	0	0
Danspara	654	3621	1897	1724	27	20	0	0
Jhaluarber	392	1561	756	805	241	276	0	0
Dansi	587	2382	1201	1181	408	407	34	35
Makardaha (CT)	2087	8713	4428	4285	449	440	45	43
Kantlia (CT)	2107	9567	4879	4688	464	456	23	30
Ankurhati (CT)	2227	11130	5750	5380	961	910	58	50
Salap (CT)	3686	15171	7826	7345	1296	1201	5	5
Nonakundu	660	2837	1406	1431	0	0	0	0
MollarChak	223	1228	648	580	213	213	0	0
Mahishnala	375	1917	940	977	786	813	1	1
Khas Mara	1251	5298	2721	2577	2137	2005	1	1
Domjur (CT)	4308	18433	9040	9393	661	744	38	37
Bhandardaha (CT)	1268	5667	2873	2794	918	946	5	2
Rudrapur (CT)	1606	6810	3469	3341	905	855	1	1
Surikhali	954	4158	2117	2041	567	561	0	0

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

Tehatta (CT)	2220	12770	6426	6344	508	474	0	0
Basudebpur (CT)	2573	13091	6657	6434	1520	1463	0	0
Barramnagar	987	4134	2145	1989	200	202	0	0
Ghosal Chak (CT)	1091	5681	2936	2745	8	12	0	0
Santoshpur (CT)	1576	7695	3879	3816	257	263	0	0
Hirapur (CT)	1463	7177	3630	3547	490	491	0	0
Dasbhanga	889	4266	2226	2040	92	72	0	0
Raghudebpur (CT)	1583	7081	3622	3459	1057	982	12	6
SialDanga	1238	5673	2905	2768	1075	1066	0	1
Kumarpur	25	155	81	74	27	28	0	0
FatikGachhi	507	2158	1117	1041	13	9	0	0
FingaGachhi	424	1856	921	935	44	48	0	0
Siddheshwar	1082	4760	2388	2372	1104	1145	0	0
Boharia	830	4035	2001	2034	1461	1466	0	0
Hari Narayanpur	331	1466	701	765	1	3	0	0
Sadatpur	695	3216	1636	1580	59	52	0	0
Anantabati (CT)	1925	9171	4760	4411	877	802	2	1
Shyampur (CT)	1784	7354	3730	3624	571	511	4	1
ChakSrikrishna (OG) (Ward No. 29) WARD NO.-0029 (Rural MDDS CODE:332878)	1935	10123	5310	4813	231	217	2	1
Kolkata (M Corp.) WARD NO.-0141	7755	41152	21452	19700	1549	1530	9	7
Kolkata (M Corp.) WARD NO.-0133	5306	25588	13294	12294	347	320	26	23
Kolkata (M Corp.) WARD NO.-0134	6281	35780	18730	17050	366	308	10	8

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

Kolkata (M Corp.) WARD NO.-0136	4485	21482	11022	10460	647	639	15	10
Kolkata (M Corp.) WARD NO.-0137	3373	19385	10507	8878	34	39	22	12
Kolkata (M Corp.) WARD NO.-0139	6937	42014	22225	19789	0	0	0	0
Kolkata (M Corp.) WARD NO.-0140	5004	30504	16074	14430	876	854	17	20
Total	185533	893958	459612	434346	76412	73673	651	628

Sex Ratio

The 'Sex Ratio' is a numeric relationship between females and males of an area and bears paramount importance in the present day scenario where the un-ethnic pre-determination of sex and killing of female foetus during pregnancy is practiced by unscrupulous medical practitioners against the rule of the law of the country. It is evident that by contrast the practice of female foeticide is not prevalent in the study area. The 'Sex Ratio' was observed as 945 females per 1000 males in the study area.

The village wise male-female population distribution for the study area is depicted and shown by graphical representation in **Figure 3.14**.

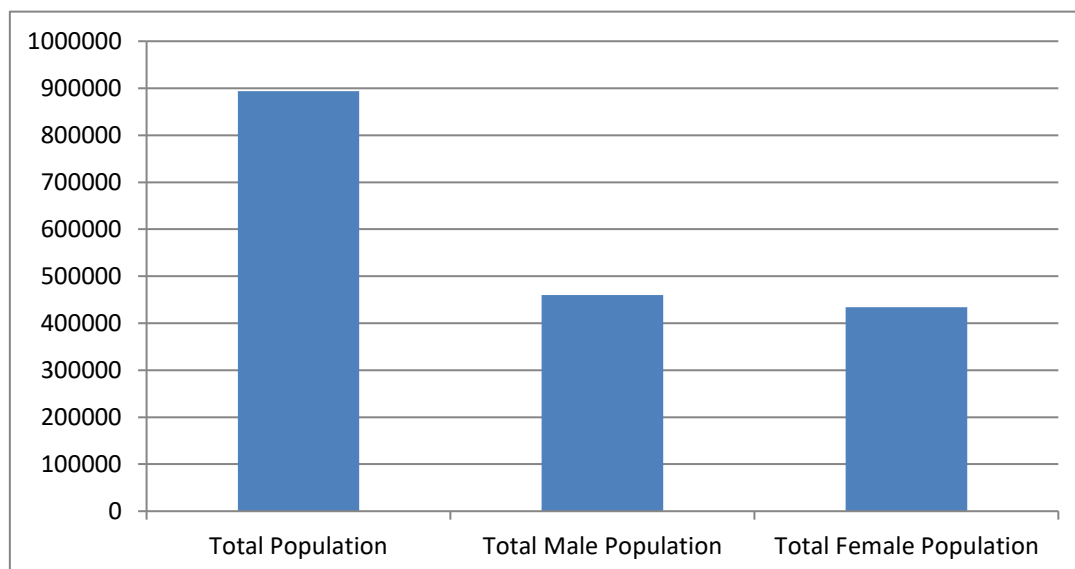


Figure 3.14 : Male-Female wise Population Distribution in the Study Area

3.13.2. Scheduled Caste & Scheduled Tribe Population

On the basis of the village/town wise SC & ST population distribution of the study area during 2011, the 'Scheduled Castes' population was observed as 150,085 persons consisting of 76,412 males and 73,673 females respectively in the study area which accounts as 16.78% to the total population of the study area. 'Scheduled Tribes' population was observed as 1,279 persons, accounting as 0.14% to the total population of the study area consisting of 651 males and 628 females. Male-female wise distribution of SC & ST population in the study area is graphically shown in **Figure 3.15.&3.16** as follows.

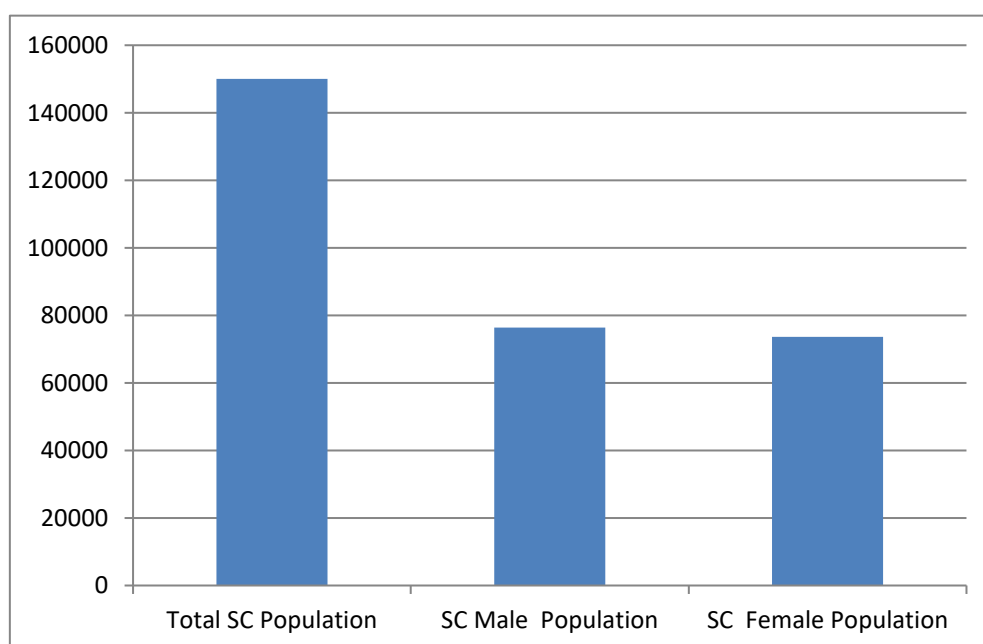


Figure 3.15 : Scheduled Caste Population in the Study Area



Figure 3.16 : Scheduled Tribes Population in the Study Area

3.13.3. Literacy Rate

Literacy level is quantifiable indicator to assess the development status of an area or region. Male-Female wise literates and illiterates population is represented in **Table 3.39**. Total literates population was recorded as 637735 persons (71.33%) in the study area. **Table 3.39** reveals that Male-Female wise literates are observed as 342016 & 295719 persons respectively, implies that the 'Literacy Rate' is recorded as (71.33%) with male-female wise percentages being 38.25 % & 33.08% respectively. The total illiterate's population was recorded as 256223 persons (28.66%) in the study area. Male-Female wise illiterates were 117596 (13.15%) and 138627 (15.51%) respectively. The Male-Female wise graphical representation of literates & illiterates population in study area villages/town is shown in **Figure 3.17**

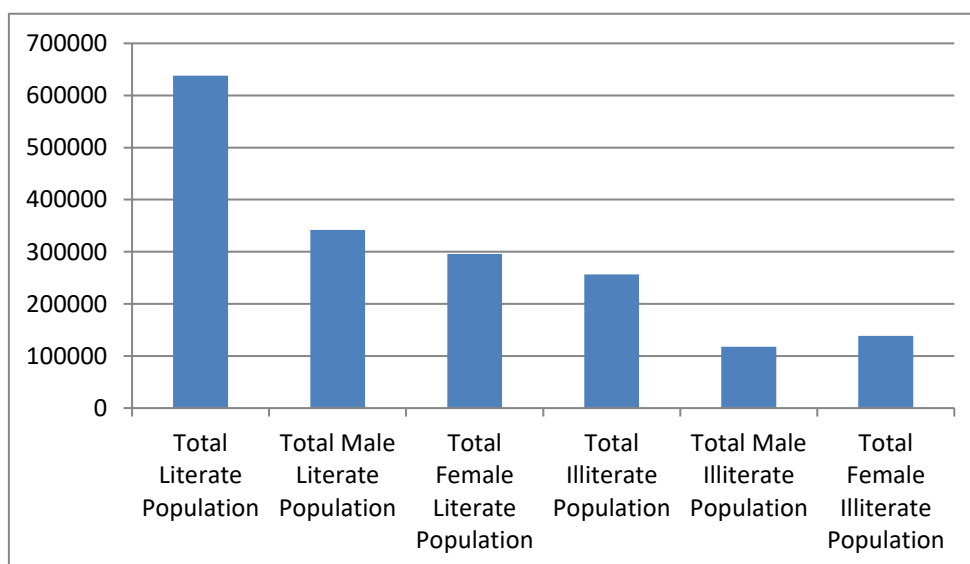


Figure 3.17 : Male-Female wise Distribution of Literates & Illiterates

3.13.4. Workers Scenario (Occupation Pattern)

Occupational pattern was studied to assess the skills of people in the study area. Occupational pattern helps in identifying major economic activities of the area. The main and marginal workers population with further classification as casual, agricultural, households and other workers is shown in **Table 3.39**

Occupation Pattern wise distribution of Population and Graphical representation of 'Workers Scenario' of the study area are shown as **Table 3.29 & Figure 3.18** respectively as follows;

Table 3.39 : Distribution of Work Participation Rate

Occupation Class	Year, 2011
Main Workers	284669 (31.84%)
Male	244892 (86.02%)
Female	39777 (13.97%)
Marginal Workers	58400 (6.53%)
Male	30651 (52.48%)
Female	27749 (47.51%)
Non-Workers	550889 (61.62%)
Male	184069 (33.41%)
Female	366820 (66.58%)
Total Population	893958 (100%)

Source: Census of India Records, 2011

3.13.5. : Workers Scenario of the Study Area

Composition of Main Workers

The 'Main Workers' were observed as **59737 (23.23%)** persons to the total population of the study area and its composition is made-up of Casual laborers as 5334 (2%), Agricultural laborers as 7881 (3%), Household workers 87612 (31%) and other workers as 183842 (64%) respectively. Composition of Main workers is shown below as **Figure 3.18**.

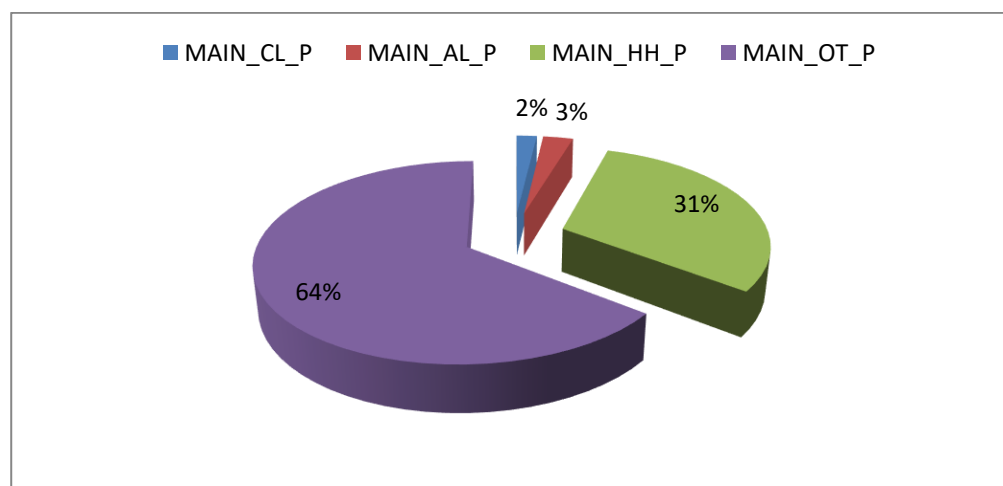


Figure 3.18 : Composition of Main Workers Population

Composition of Marginal Workers

The total marginal workers are observed as **58400(6.53%)** of the total population comprise of Marginal Casual Laborers as 1406 (2%), Marginal Agricultural Laborers as 3796 (7%), Marginal Household laborers as 24471 (42%) and marginal other workers were also observed as 28727 (49%) of the total marginal workers respectively. Details about marginal workers in the study area are tabulated in **Table 3.39**. Composition of Marginal workers is shown in **Figure 3.19** as follows;

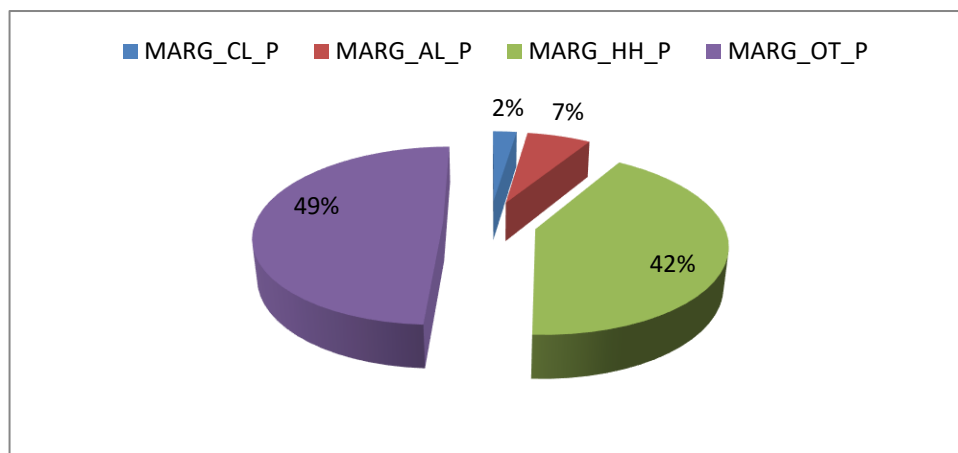


Figure 3.19 : Composition of Marginal Workers

Composition of Non-workers

The total Non-workers population was observed as **550889 (61.62%)** of the total population of the study area. Details about total Non-workers of the study area with Graphical representation are compiled in **Table 3.40** and shown by **Figure 3.20** as follows;

Table 3.40 : Composition of Non-Workers

Non-Workers Population		
Persons	Males	Females
550889(61.62%)	184069(33.41%)	366820(66.58%)

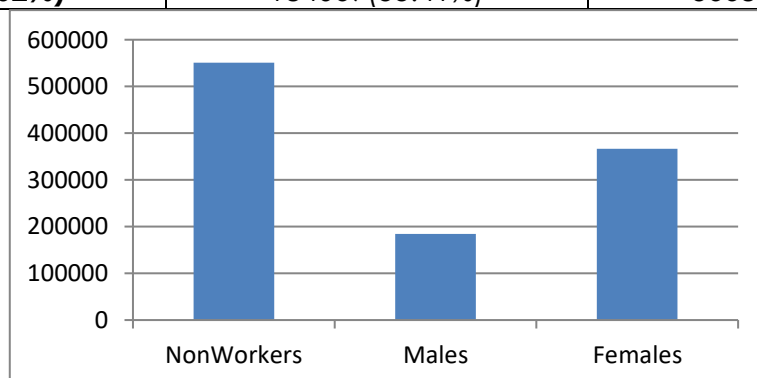


Figure 3.20 : Composition of Non-Workers

3.13.6. Availability of Basic Infrastructure Facilities & Amenities in the Study Area

A review of basic infrastructure facility and amenities available in the study area villages has been done on the basis of the field survey and Census records, 2011.

Education Facilities

As per the Census Records of India 2011, there are about 76 Primary Schools existing in the revenue villages as rural part of the study area. Middle schools are 19 no's exists in the rural part of the study area. 6 no's of Higher Secondary Schools facility is available in the study area. 11 no of Secondary Schools are observed in the study area. The educational facilities have been further strengthening now and a number of private public schools and colleges are also functioning in the surroundings of the study area. Besides, there are Engineering and Medical colleges available in Towns and District headquarters only. There is considerable improvement in educational facility.

Medical Facilities

The medical facilities are provided by different agencies like Govt. & Private individuals and voluntary organizations in the study area. As per the compiled district census handbook information of 2011, 2 Primary health centers are available in study area. 19 primary health sub-centers exists in the rural part of the study area. 4 Mother & Child Welfare Centre are available in the study area. 17 Dispensary facility was available in any revenue villages of the study area.. Specialized medical facilities are available in Towns and District Headquarter.

Potable Water Facilities

Potable water facility is available in most of the villages of the study area. The entire study area has plenty of good potable water facilities. Most of the villages are served with Hand Pumps for potable water facility in the study area. Out of total 43 revenue villages 20 villages (of the study area are served with River/Canal water as drinking water in the study area. As per the census records of 2011, about 34 revenue villages are being served with Tank/Pond/Lake in the study area. 24 of the villages, hand pumps are observed in the study area. Good potable water facilities are available in the study area.

Communication, Road, Transport and Banking Facilities

Apart from Post &Telegraph (P & T) services, transport is the main communication linkage in the study area. Out of 43 villages/towns of the study area, only 1 revenue village, is served with Post Office facilities in the study area, remaining villages are depending upon these villages and towns of the study area.

The study area has good road network, passes from the area. National Highway (NH-16) is located at about 0.29 km,N.Site is well connected with NH-16 and has well developed internal road within the existing site as well.

About 22 villages are served with Pucca road facility in the study area. Banking facilities are poor in the study area and almost all the schedule commercial banks with ATM facility are available in urban areas and the district HQ.

Power Supply

It is revealed from the compiled information on amenities availability as per the census record of 2011; 11 villages are electrified for all purpose in the study area. Village wise 'Basic infrastructure and amenities' availability data for the entire study area is compiled and presented in **Table 3.44** as follows;

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

Table 3.41 : Village wise Basic Amenities in Study Area

Name of the Village/Town	P	M	S	S	C	P	P	M				H	T	R	T	P	P	B	R	P	K	F	E	E	E	E	Nearest Town Name	Nearest Town Distance from Village (in Km.)
FingaGachhi	1	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	1	2	1	2	1	2	HAORA	FingaGachhi
SialDanga	8	3	2	1	0	0	0	0	0	2	2	1	2	2	1	2	2	2	2	2	1	2	1	1	1	1	HAORA	SialDanga
Kumarpur	1	0	0	0	0	0	0	0	0	2	2	1	2	2	1	2	2	2	2	2	2	2	1	1	1	1	HAORA	Kumarpur
Boharia	3	0	0	0	0	0	1	0	0	2	2	2	2	1	1	2	2	2	2	1	1	2	1	1	1	1	HAORA	Boharia
Siddheshwar	4	1	1	1	0	0	1	0	1	2	2	2	2	1	1	2	2	2	2	1	1	2	1	1	1	1	HAORA	Siddheshwar
FatikGachhi	1	1	1	0	0	0	1	0	1	2	2	2	2	1	1	2	2	2	2	1	1	2	1	1	1	1	HAORA	FatikGachhi
Mahishnala	1	0	0	0	0	0	0	0	0	2	2	1	2	2	1	2	2	2	2	2	1	2	1	2	2	2	HOWRAH	Mahishnala
Nonakundu	2	1	1	1	0	1	1	1	1	2	2	1	2	1	1	1	2	2	2	1	1	2	1	1	1	1	HOWRAH	Nonakundu
MollarChak	1	0	0	0	0	0	0	0	0	2	2	1	2	2	1	2	2	2	2	2	1	2	1	2	2	2	HOWRAH	MollarChak
Rajapur	1	1	1	0	0	0	1	1	0	2	2	1	2	1	1	2	2	1	2	1	1	2	1	1	1	1	HOWRAH	Rajapur
Baigachhi	1	0	0	0	0	0	0	0	0	2	2	1	2	1	1	2	2	1	2	1	1	2	1	2	2	2	HOWRAH	Baigachhi
Khas Mara	4	2	2	1	0	0	1	0	0	2	2	2	2	2	2	1	2	2	2	2	2	2	1	2	2	2	HOWRAH	Khas Mara
Amre	1	0	0	0	0	0	0	0	0	2	2	1	2	2	2	2	2	2	2	2	2	2	1	2	1	2	HOWRA	Amre
Dharsha	1	0	0	0	0	0	0	0	0	2	2	2	2	2	2	2	2	2	2	1	1	2	1	2	1	2	HOWRA	Dharsha
Pairatangi	1	1	0	0	0	0	0	0	0	2	2	2	2	1	2	2	2	2	2	1	1	2	1	2	1	2	HOWRAH	Pairatangi
Danspara	1	0	0	0	0	0	1	0	0	2	2	2	2	1	1	2	2	2	2	1	1	2	1	2	1	2	HOWRAH	Danspara
Jhalarber	1	0	0	0	0	0	0	0	0	2	2	2	2	1	1	2	2	2	1	1	1	2	1	2	1	2	HOWRAH	Jhalarber
Dansi	2	0	0	0	0	0	1	0	0	2	2	2	2	2	2	2	2	2	1	1	2	2	1	2	1	2	HOWRAH	Dansi
Jala Dhulagiri	0	0	0	0	0	0	0	0	0	2	2	2	2	2	1	2	1	1	2	1	1	2	1	2	1	2	HAORA	Jala Dhulagiri
Sulati	1	0	0	0	0	0	1	0	1	2	2	1	2	2	1	2	2	2	2	2	1	2	1	2	1	2	HAORA	Sulati

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

Sandhipur	1	1	0	0	0	0	1	0	0	2	2	1	2	2	1	2	2	2	2	2	1	2	1	2	1	2	HAORA	Sandhipur
Bhagabatipur	2	0	0	0	0	0	0	0	0	2	2	1	2	1	1	2	2	2	2	1	1	2	1	2	2	2	HAORA	Bhagabatipur
Ghoraghat	1	0	0	0	0	0	1	0	0	2	2	1	2	1	1	2	2	2	1	2	2	2	1	2	2	2	HAORA	Ghoraghat
Dadpur	2	0	0	0	0	0	0	0	0	2	2	2	2	1	1	2	2	2	2	2	2	1	1	2	2	2	ULUBERIA	Dadpur
Betiari	1	0	0	0	0	0	0	0	0	2	2	2	2	1	1	2	2	2	2	2	2	2	1	2	2	2	ULUBERIA	Betiari
Manoharpur	1	0	0	0	0	0	1	0	0	1	2	2	2	2	2	2	2	2	2	2	2	1	1	2	1	2	ULUBERIA	Manoharpur
Kanyamani	1	1	0	0	1	0	0	0	0	1	2	2	2	1	1	2	2	2	2	2	1	2	1	2	1	2	ULUBERIA	Kanyamani
Mahishgot	2	1	0	0	0	0	0	0	0	2	2	1	2	2	1	2	2	2	2	2	1	2	1	2	1	2	HAORA	Mahishgot
ChaturBhujkathi	1	0	0	0	0	0	0	0	0	2	2	1	2	2	1	2	2	1	2	1	1	2	1	2	1	2	HAORA	ChaturBhujkathi
Alampur	2	1	0	0	0	0	1	0	6	1	2	1	2	1	1	2	2	1	2	1	2	2	1	2	1	2	HAORA	Alampur
Jangalpur	4	0	0	0	0	0	0	0	0	2	2	1	2	2	1	2	2	1	2	2	1	2	1	2	1	2	HAORA	Jangalpur
Jala Bishwanathpur	8	3	1	1	0	0	1	0	0	2	2	2	2	1	1	1	2	2	2	1	1	2	1	1	1	1	AMTA	Jala Bishwanathpur
Ranihati	1	0	0	0	0	0	1	0	1	2	1	1	2	1	2	2	2	2	2	1	1	2	1	2	2	2	ULBERIA	Ranihati
Dakshin Panchla	2	0	1	0	0	0	1	0	0	2	2	1	2	2	1	2	2	2	2	1	2	2	1	2	2	2	ULBERIA	Dakshin Panchla
Dhamsa	1	0	0	0	0	0	1	0	0	2	2	2	2	2	2	2	2	2	2	1	1	2	1	1	1	1	ULBERIA	Dhamsa
Kulai	2	0	0	0	1	1	1	1	0	2	2	2	2	2	1	2	2	1	2	1	1	2	1	2	1	2	ANDUL	Kulai
Satgharia	1	0	0	0	0	0	0	0	0	2	2	2	2	2	1	2	2	2	2	2	1	2	1	2	1	2	ANDUL	Satgharia
Belkulai	2	0	1	1	0	0	0	0	3	2	2	2	2	2	1	1	2	2	2	2	2	2	1	2	2	2	ULBERIA	Belkulai
Barramnagar	1	1	0	0	0	0	0	0	0	2	2	1	2	1	1	2	2	2	2	2	1	1	1	2	1	2		Barramnagar
Surikhali	1	0	0	0	0	0	0	0	0	2	2	1	2	1	1	2	2	1	2	1	1	1	1	2	1	2	ULUBERIA	Surikhali
Dasbhanga	1	1	0	0	0	0	0	0	3	2	2	1	2	2	1	2	2	2	2	1	1	1	1	1	1	1	ULUBERIA	Dasbhanga
Hari Narayanpur	1	0	0	0	0	0	0	0	0	2	1	1	2	2	1	2	2	2	2	2	2	1	1	2	1	2	HAORA	Hari Narayanpur
Sadatpur	1	0	0	0	0	0	1	1	0	1	1	1	2	1	1	2	2	1	2	2	1	2	1	1	1	1	HAORA	Sadatpur
Total	7	1	1	6	2	2	1	4	1	Status for Availability and Non-Availability is shown as A (1) & NA (2) respectively																		

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

	6	9	1				9		7	
--	---	---	---	--	--	--	---	--	---	--

Chapter 4. ENVIRONMENT IMPACTS AND IDENTIFICATION

4.1. Introduction

Environmental Impact Assessment helps in identifying the likely impacts due to the project activities for all stages of the project viz, design, construction and operation stage. Impacts are quantified using established practices, tools and mathematical models followed by identification of mitigation measures to mitigate the impacts to acceptable levels.

The construction and operation of the project "Expansion of Cement Grinding Unit at Sankrail" involves various activities which may have impact on the environment. Impact analysis has been carried out for all the activities under project for physical, biological and socio-economic environment. Key issues identified requiring greater attention are related to impact on air, water, noise environment, solid waste management, traffic management and land during construction and operation period. Impacts are identified and evaluated in relation to all the project activities during project implementation (construction) phase and operation phase. Detailed impact assessment is given in sections below:

4.2. Summary of Baseline of Project Area

Data on quality and status of all the physical, biological and social environments is collected for the project area through primary and secondary sources and is summarized in Table 4.1.

Table 4.1 : Summary Baseline Scenario of Project Area and Likely extent of Impact

S. No.	Environmental Component	Baseline Scenario	Sensitivity Level of baseline scenario	Environmental Impact Probability due to Project Activities
1.	Air quality	The site is located close to the Jalan industrial complex and AAQ of the area is well within the NAAQS except Jalan Industrial complex. AAQ is the main concerns in this project.	AAQ is the main concerns in this project.	Moderate Project is likely to generate dust during construction phase which is likely to be site specific Air and stack emissions during operation phase
2.	Noise Level	Day Time and nighttime Leq level in study area is well within the prescribed standards	Noise is the main concern during construction and operation phase	Moderate (Noise generation during construction and operation phase)
3.	Seismicity	III	Moderate seismic risk zone	No direct impact from project activities, however

				new bulding shall be constructed considering the seismicity of the area
4.	Topography	Flat (0-33 metres)	--	water logging and inundation is anticipated during rains
5.	Drainage	There is no nalla or drain present on proposed site. The drainage pattern of the stud area is mainly controlled by Hoogly river.	As no nalla or drain present on the identified land no impact on drainage is anticipated	No impact anticipated
6.	Flora & Fauna	No major flora and fauna is present on the proposed land. The identified land is under possession of ACL. No tree present on the land. No protected area (wild life sanctuaries or national parks) exists within 10 km of project activity areas.	No significant bio-diversity. No endangered or threatened species. Native species of trees.	Dense greenbelt shall be developed in 33% area
7.	Demography	Project area is urban and populated.	Urban	Project will generate employment for the surrounding population. Further infrastructure development in surrounding villages shall be carried under CSR activities
8.	SW quality	No water body traverses through the project area. Hoogly river is located about 4.0 km S of the site.	Impact is anticipated due to discharge of untreated waste water.	All the sewage generated from the plant shall be treated and recycled hence no impact anticipated.
9.	GW Quality	Overall the parameters in ground water sample were well within the desired limit of Indian Standard IS:	Impact due to water drawl	Moderate Already obtained from SWID Waste water treatment shall be

		10500-2012 and is potable.		done and reused. Further provision of rain water harvesting.
10.	Soil Quality	Texture is sandy clay loam, sandy loam and calyloam with moderate fertility	Not polluted	Low All the solid waste generated from the shall be utilized or managed as per the norms.
11.	Geology	The alluvium formation is consists of clays, silt, sand, gravels and boulders etc	--	None No economic menarals present with in the study area as well as in project site.
12.	Land Use	Land is under possession of ACL and present Land use of project site is agriculture.	Land use will be change to industrial.	Permanent (already converted to non agricultural land)

Source: Field Survey

4.3. Identification of Project Activities and Associated Impact

The natural (physical & biological) and human (social) environmental components that have scientific, economic, social or cultural archaeological, historical, or other significance and are considered in the environmental assessment process. Project activities which may have impact on environmental components includes the following:

- Site clearance before start of construction work
- Construction of plant, Utilities and admin buildings
- Operation of the project (clinker handling and storage, Dust and air emission due to production processes and dust and exhaust gas from transportation facilities, waste water and solid waste generation etc.

Impact Identification

The project will affect to both natural and socio-economic environments during implementation process. These impacts could be generated from different reasons and causing different impacts to environment. These impacts could be generated in different periods of the project for long-term or short-term. As per the nature of activities involved, it is apparent that both construction and operation phase impacts are associated with the project. Source and scope of impacts on environment are listed in **Table 4.2.**

Table 4.2 Source, object and scope of environment impact

No.	Source of environment impact	Affected object	Scope of environment impact
I	Construction period		
1	Dust and exhaust gas from construction machines in construction period (Dust, CO, SO ₂ , NO _x , CO...)	Air environment; Direct construction workers; Residential areas locate near to project area; Ecological environment	Short-term in construction time
2	Noise generated in construction time	Direct construction workers; Residential areas locate near to project area;	Short-term (in construction time)
3	Domestic wastewater from worker's activities in construction time	Surface water source (Hooglyriver) underground water, soil, ecological environment...	Short-term (in construction time)
4	Overflowing rainwater	Surface water source, ecological environment.	Short-term (in construction time)
5	Solid waste -Construction waste -Domestic solid waste -Harmful solid waste	Soil, water, air environment; Health of workers and inhabitants surrounding areas; Ecological environment	Short-term (in construction time)
6	Gathering numerous people	To make disordered inhabitant life, causing insecurity and increasing social evils.	Short-term (in construction time)
7	Environmental problems caused by people	Causing unsafely for direct construction workers and people in area	Short-term (in construction time)
II	Operation phase of the project		
1	Dust and exhaust gas generated in production processes and transportation activities	Air environment; Direct construction workers; Residential areas locate near to project area; Ecological environment	Long-term (during operation process of project)
2	Noise generated in operation processes.	Direct construction workers. Residential areas locate near to project area.	Long-term (during operation process of project)
3	Generation of Domestic and industrial wastewater	Contamination to Surface water source, underground water, soil, ecological environment...	Long-term (during operation process of project)
4	Solid waste Generation of dust, used oil and other domestic waste	Soil, water, air environment; Health of workers and inhabitants surrounding areas; Ecological environment	Long-term (during operation process of project)
5	Environmental problems	Causing unsafely for direct	Long-term (during

	caused by people	workers and people in area	operation process of project)
--	------------------	----------------------------	-------------------------------

4.4. Impact Assessment and Evaluation

Identification of project activities (project implementation and operation phase) and environmental components which may be impacted due to each of project activities is carried out and is given in **Table 4.2**. Significance of impact on each of the identified environmental components for all the activities is assessed and evaluated using qualitative and quantitative techniques. Thereafter, cost-effective but appropriate mitigation measures are proposed to eliminate or minimise the identified impacts. An EMP has been designed to ensure the effective implementation of proposed mitigation measures (refer chapter 8). Impact assessment and evaluation along with the mitigation measures is given in sections below:

4.5. Impacts during Implementation/Construction Phase

4.5.1. Impact due to site clearance

The total area available with the ACL including existing plant at Sankrail unit is 32.64 ha. Out of the total area existing Plant is located in 18.36 ha. Rest of the 14.28 ha has been proposed for said expansion. The land is already in possession of ACL. The current land use of the site is agriculture fallow land. There is no trees present on the identified land however few herbs and grasses needs clearing. The site clearance and levelling work will require excavation activities and leads to dust and debris generation in the study area. Air emission and Fugitive dust emission is anticipated due to operation of construction machineries like trucks/dumpers, excavator etc. the impact associated are for short term and these impacts can be managed with the mitigation measures, which are proposed below.

Mitigation Measures

- Excavators shall be used for construction. The excavated material (debris) shall be stacked at safe places for backfill at a later stage of construction.
- To control the fugitive emission during construction phase adequate water sprinkling system will be developed in dust generating area.
- All trucks/machineries used for construction should have PUC.
- All the loose construction material will be transported in covered trucks/dumpers.
- Regular maintenance of all the construction equipment including dumpers/trucks to prevent leakage and other emissions.
- ACL has already developed a greenbelt in 4.86 ha area in existing unit. Further in proposed expansion ACL proposed to develop additional greenbelt in 5.91 ha to achieve total greenbelt in 10.77 ha area (33% of the total project area).
- Greenbelt development shall start along with construction activities.

4.5.2. Impact Due to Construction site, material storage and debris disposal

Establishment and operation at construction site may lead to noise pollution, dust generation and generation of solid waste and may have impact if located close to

residential area or environmental and social sensitive areas. Construction site involves operation of various machinery and equipments, which may pose occupational health risks to construction workers. Storage and spillages of oils can contaminate the soil. Inadequate space for parking may also lead for vehicle idling and dust generation. There will be generation of sewage and run-off from site, which shall be managed to prevent generation of unhygienic conditions and sanitation issues. Uncontrolled disposal of debris and wastes may leads to dust generation, change in land use and impact the surrounding aesthetics. These issues are short term in nature and are restricted to construction period and construction site but may be significant if not managed. All the anticipated impacts are manageable with the proposed mitigation measures which are measures are given below:

Mitigation Measures

- Construction site shall be established within the project area and location of storage yard/construction site/debris disposal shall be away from habitations.
- Hot mix pant/crusher or any plant if installed shall be installed at least 800 m away from the nearest settlement preferably in downwind direction. It shall be installed only after obtaining consent to establish from WB State Pollution Control Board.
- Speed limits at site shall be maintained between 15-20 km/hr at construction sites
- Adequate parking shall be available for the transportation vehicle and construction machinery
- 2 Bio-toilets (one for male and one for female) shall be provided at construction site. The bio toilet must have provision of at least 1000 litres overhead water storage. It shall be well maintained and in usable condition at all the times. It shall be regularly cleaned, and overhead tank replenished as per requirement. Work force shall be oriented to use mobile toilets. No open urination/defecation shall be allowed.
- Drinking water facility shall be available for workers at site
- Loose construction material and waste storage area shall be paved and covered
- Oil shall be stored on concreted floor with spillages and leak collection pits
- Oil interceptor shall be provided in vehicle cleaning areas
- All construction vehicle shall comply with traffic rules and carry PUC certificate.
- First Aid Kits shall be available at construction site.
- Fire extinguishers shall be installed in storage yard area
- Location of storage of each material shall be pre-identified and signage shall be provided
- Provision for sprinklers for dust suppression shall be made
- Develop system for maintaining record of waste generation and disposal

4.5.3. Impact Due to Material Sourcing and Transportation

Transportation of material may generate dust and other vehicular emissions (SO₂, NO₂ and CO) leading to air pollution. There will be increased vehicular movement on roads

due to transportation of material which may lead to traffic congestion and increased risk of accidents. These impacts are short term but are manageable if suitable mitigation measures are taken up. Construction material if sourced from unauthorised sourced may lead to illegal mining or other activities.

Mitigation Measures

- Construction material like sand, stone etc shall be bought from authorized suppliers and environmentally approved quarries as approved by the Engineer
- Transportation of materials shall be done in covered conditions only
- No overloading of vehicle shall be allowed
- Material shall preferably be sourced from local market or nearby areas
- Contractor shall submit details of the material sourcing with list of material, suppliers and copy of the environmental clearances for borrow areas and quarries as applicable
- Arrangement for transportation of material under cover and need based water spray system for dust suppression during loading and unloading

4.5.4. Impact on Occupational Health & Safety of workers due to project activities

Construction activities involve risks to health & safety of construction workers as it involves handling of heavy construction machinery/vehicle/components & lifting equipment and working on heights. This will involve risks of working on height and lifting of heavy materials. Occupational risks involved during implementation phase are fall, slip, accidents, failure of crane, fire, electric shock, unconsciousness due to working in sun at heights etc. Safety measures are required to be taken up to prevent any injury or accident during the construction phase. Measures are proposed to ensure occupational, health & safety of the workers and staff during project implementation phase and are listed below.

Mitigation Measures

- Contractor shall depute environmental and safety officer to ensure compliance to EMP and health and safety measures and coordinate with ACL Environment & Safety head.
- Contractor shall prepare a construction safety plan detailing action to be taken in case of emergency and submit to ACL for prior approval.
- Construction/excavation activity area shall be barricaded for safety reasons.
- The contractor will make sure that during the construction work all relevant provisions of the Building and Other Construction Workers (regulation of employment and conditions of services) Act, 1996 are adhered to. The Contractor will comply with all the precautions as required for ensuring the safety of the workmen as per the country' labour regulations and International Labour Organization (ILO) Convention No-62 as far as those are applicable to this contract.
- All work force shall be subjected to an orientation program to familiarize them with work requirements, safety practices at work, safe distances to

keep from earth moving equipment, emergency response etc. to be adopted to ensure their own safety and that of other workers and public around operational areas.

- Visitors/officials to worksite are to be provided with PPEs (such as hard hats and safety boots & safety jackets) and shall be briefed ongoing operations on that specific time and related safety requirement at work site including safe distances to keep, while at site visit.
- Contractor will ensure that each worker use the safety equipments like Hard hat or helmets, Safety shoes, goggles, Protective eye gear, helmets, gum boots and vests when on construction site.

4.5.5. Impact on Air Environment

Dust will be the main pollutant affecting the ambient air quality of the area during the construction phase. Dust will be generated during excavation operation, levelling and other construction activities. Vehicular movement of trucks, dumpers and construction machinery will also generate dust. Stockpiles, other construction material and operation of DG sets are the other sources of air emission during construction period. Short term localised and reversible impact is expected due to dust emissions generated during the construction stage. Mitigation measures proposed are given below:

Mitigation Measures

- Barricading of construction site.
- Water sprinkling shall be done at regular interval in dust generating areas.
- Providing suitable surface treatment to ease the traffic flow and regular sprinkling of water will reduce the dust generation.
- Aggregates and sand will be stockpiled at suitable places (after stabilizing the surface), near the boundary wall so that the wall acts as windshield.
- Necessary water sprinkling arrangement will be provided around the stockpiles and used whenever necessary to make them moist.
- Cement and steel will be stocked inside covered sheds.
- Construction equipment having 'Pollution Under Control Certificate' will be deployed during the activity to restrict the exhaust emissions.

4.5.6. Impact on Noise Environment

The noise generation will be substantial during such type of medium scale construction activities. Typical noise sources of A class of construction equipments during construction phases is presented in **Table 4.3**.

Table 4.3 Typical Noise Sources during Construction Phase

Description	Noise Level dB(A)	Reference Distance (m)
Earth Movers		
Dozers	95-100	~15 m
Front Loaders	72-84	~15 m
Backhoes	72-93	~15 m
Tractors	76-96	~15 m

Description	Noise Level dB(A)	Reference Distance (m)
Tippers/Trucks	82-94	~15 m
Material Handlers		
Concrete mixers	75-83	~15 m
Concrete pumps	81-83	~15 m
Cranes (movable)	75-86	~15 m
Vehicular Traffic (Construction material & plant machinery)	85-98	~15 m
Stationary Equipments		
DG Sets	90-95	~15 m
Pumps	69-71	~15 m
Compressors	74-86	~15 m
Impact Based Equipments		
Pneumatic Wrenches	83-88	~15 m
Jack hammer and rock drills	81-98	~15 m

According to the Table 4.3, the noise level caused by these equipments in the distance of 15 m will be in range of 70-96 dB(A).

It is evident from the above table that operation of construction machinery & equipment will generate high noise levels due to which it may affect the health of construction labour and nearby residents if the adequate mitigation measures are not taken. Highest noise level during construction phase may reach up to 96 dB(A).

Estimations are also made to calculate the distance at which the sound levels will attenuate to the acceptable noise levels as defined by CPCB in Noise Rules, 2000. Standard sound wave propagation equation is used to calculate the noise levels at receptor and the equation is given below.

$$\text{Noise(receptors)} = \text{Noise(source)} - 20 \log[\text{distance(receptor)}/\text{distance (Source)}]$$

For purpose of calculating noise level using above equation, flat terrain is considered, and environmental attenuation factors are not considered so as to formulate the worst-case scenario. Noise levels predicted by logarithmic equation up to a receptor location of 1 km is presented in **Figure 4.1**. Referring to the graph given in Figure 4.1, it can be said that noise levels of 65 dB(A) can be achieved at distance of app. 500 m from noise source. This distance is required when no noise shield, buffer or absorbent is used. When these are used the distance required may reduce significantly. Also, minimum distance which is required for each type of land use as defined CPCB under Noise Rules, 2000 is calculated and is given in **Table 4.4**.

Table 4.4 : Minimum Distance Required from Different Land Use (Pre-construction phase) to Achieve Prescribed Noise Levels as Per Noise Rules, 2000

Zone	Receptor Noise level dB(A) as per CPCB	Minimum Safe Receptor Distance (m)
Residential	55	622
Commercial	65	197
Industrial	75	63
Silence	50	1107

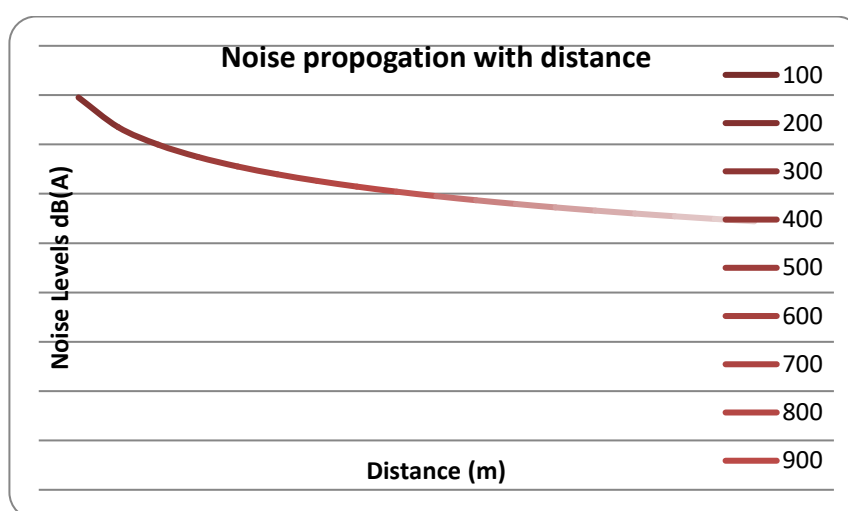


Figure 4.1 : Noise Levels at Various Distances from Construction Equipment

As per baseline study, the noise levels at all the locations are within respective specified standards, thus the impact on noise environment will be negligible to nearby residents. Also, the construction activities to the proposed site will be temporary and marginal till completion of the project. Proposed mitigation measures for minimizing noise levels from the site are given below.

Mitigation Measures:

- All the construction machinery and equipment used should be provided with adequate noise mufflers and noise suppression equipment. Proper lubrication and maintenance of the machinery & equipment and vehicle to be carried out to minimize the noise generation due to abrasion
- Honking should be prohibited at the site. For management of traffic, a traffic supervisor should be available 24 X 7.
- Provision of Speed limit for vehicles and machinery at the site
- All noisy activities should be carried out during daytime only (9:00 AM to 10:00 PM)

- Activity area should be barricaded. Barricading helps to lower the noise levels.
- Casting yards, batching plants etc. should be located away from residential and sensitive areas
- Temporary noise shields should be provided all around the heavy noise making activity. Noise blankets, combined sound absorbent etc may be used to reduce the noise level in high noise generating activities.
- Noise level from loading & unloading of material can be reduced by usage of various types of cranes & placing material on sand or sandy bag beds.
- Noise monitoring should be carried out to ensure the effectiveness of mitigation measures and develop a mechanism to record and respond to complaints on noise.
- Adequate parking space to be provided at the project site to minimize the honking requirement due to congestion and jams and restricting the speed limits.
- Job rotations should be practiced for workers, working in noisy environment.
- Protection devices (earplugs or earmuffs) shall be provided to the workers operating near high noise generating machines.
- Workers in those sections where periodic adjustment of equipment/machinery is necessary, should be provided with soundproof control rooms, so that exposure to higher noise level is reduced
- Hearing test for the workers prior to deployment at site and high noise areas followed by periodic testing every six months.
- Automation of equipment and machineries, wherever possible should be done to avoid continuous exposure of workers to noise
- Machinery and construction equipment must have validated registration and meet cpcb standards.
- OSHAS guidelines should be followed for maintaining noise exposure levels of the construction workers As per occupation standards, workers' exposure to 90 dB(A) noise level should not be more than 8 hours. OSHAS guidelines should be followed for exposure to specific noise levels for workers and are listed in **Table 4.5**.

Table 4.5 : OSHAS Noise Exposure Limits for The Work Environment

Noise Levels in dB(A)	Permissible Exposure (hours & minutes)
85	16 hrs
90	8 hrs
96	3 hrs 30 minutes
102	1 hr 30 minutes
108	40 min
115	15 min
121	6 min
127	3 min
130	1 min

Source: Marsh, 1991, p.322

Adoption of the above measures may regulate the noise levels during construction phase and reduce the impacts.

4.5.7. Impact on Water Quality

Water will be needed mainly for construction and domestic purpose i.e. for drinking and sanitation. 60 KLD water will be required during construction stage. Water will be sourced from existing unit. Drinking and sanitation facilities shall be provided to workers and staff during construction. Water will also be needed for sprinkling to reduce dust emission. Storm water drains will be made immediately after starting construction activity. Wastewater will arise from site offices, canteens and other washing facilities which may impact the ground water if not managed properly.

Mitigation Measures

- Wastewater arising from site offices, canteens and other washing facilities will be collected and treated in the existing STP and then reused for dust suppression.
- Oil separator / interceptor will be provided near vehicle parking site, workshop and canteen to prevent the release of oil and grease into drainage system.
- The oil and grease separators will be cleaned on regular basis.
- The treated water will be reused for gardening and horticulture purpose. Sedimentation pits will be provided at appropriate location to trap the silt laden runoff water and prevent excessive silt from going outside.

4.5.8. Solid waste Management

Solid waste generated during construction phase comprise of excavated soil, used bags, bricks, concrete, MS rods, tiles, wood etc, Excavation of the soil will make the soil loose thereby making soil prone to wind and water erosion. Development of project will lead to loss of topsoil. The exact volume of top soil can not be estimated at this stage. Construction & demolition waste (debris, unused iron bars or damaged support structures, quarry dust) may affect soil at the site, if such wastes are disposed in an uncontrolled manner. Demolition waste will be generated from site. In case fuel/oil is stored at site then occurrence of accidental fuel spillage or leakage cannot be ruled out which in the process will contaminate the adjoining soil strata. Such soil contamination can be severe in case of voluminous leakage, thus are required to be managed. Movement of construction vehicles and equipment may lead to soil compaction on haulage roads and soil in nearby area, if the vehicle/equipment are parked in nearby areas. Soil may be contaminated due to inappropriate disposal of liquid waste, (lubricating oil and fuel spills, waste oil and lubricant and vehicle/equipment washing effluent) and solid waste (fuel filters, oily rags) likely to be generated from repair and maintenance of transport vehicles, construction equipment and machinery. Soil may also be contaminated due to inappropriate disposal of domestic solid waste and sewage from construction camps. But such a surface soil contamination will be short term and insignificant in nature. But in proposed project, the workers can be tapped from nearby village so there will be no issue of generation of domestic waste and sewage from labour camps. The impact during construction

phase will be temporary till the construction process and will be insignificant as all the waste will be managed as per the guidelines as mentioned below:

Mitigation Measures

- Top soil is required to be preserved and re-used completely. Entire excavated soil will be re-used completely either for filling or for landscaping purpose.
- Recyclable material will be sold to authorized recyclers and remaining will be disposed off at the designated locations by Municipal Authorities as per C & D Waste Management Rules, 2016 and further amendments.
- Excavation and filling operation should be carried out in parallel so as to minimize the soil erosion. Unusable debris material should be suitably disposed off at the designated locations by Municipal Authorities as per C & D Waste Management Rules, 2016
- Compaction of soil shall be undertaken by sprinkling the water to minimize the surface runoff and erosion.
- 15 cm of top soil layer shall be stripped off prior to excavation and shall be stored separately in covered condition and used for landscaping purpose in later stage. This should be stored in the form of the heap with the slide slopes covered with grass
- Prohibiting usage of plastic bags and thermocol disposables.
- Construction & demolition waste generated should be segregated at site into recyclable, reusable & rejected fraction. Recyclable should be sold to authorized vendor, reusable waste should be stored at site for usage and rejected fraction should be disposed as per C & D Waste Management rules, 2016.
- Adequate toilets & bathrooms shall be provided to prevent open defecation. Mobile toilets fitted with anaerobic treatment facility shall be provided at construction site. Sewage shall be disposed-off on a daily basis at the existing STP.
- Temporary storm water drainage network and sedimentation tank should be developed at the site to minimize soil erosion and inflow in the lake.
- Fuel, hazardous waste like used oil from DG sets shall be stored in HDPE containers and shall be stored on paved surfaces in isolated location to prevent its spillage and contamination of soil. Used oil shall be disposed off through authorized vendors only.
- Movement of construction vehicles shall be restricted to the designated haulage roads only to prevent compaction of soil in other areas
- Sedimentation tanks shall be provided with storm water drain to arrest the sediments and these sediments shall be removed and stored with remaining excavated soil

4.5.9. Impact on Land Use

The total area available with the ACL including existing plant at Sankrail unit is 32.64 ha. Out of the total area existing Plant is located in 18.36 ha. Rest of the 14.28 ha has been proposed for said expansion. The land is already in possession of ACL. The current land use of the site is agriculture fallow land. At present no agriculture is being done at this land. There is no trees present on the identified land however few herbs and grasses

needs clearing. The land use of the site will be changed into industrial. The site is almost flat and elevation ranges between 2 to 5 amsl. However, there will be minor change in topography of the project site due to site filling and leveling. Generation of Domestic liquid waste, Construction waste Debris, Scraps, excavated soil, used bags and steel waste are other impacts on the land.

Mitigation Measures

- Change in existing Land use\Land cover from agricultural fallow land into industrial uses will be for longer duration and this change in Land use\Land cover shall be confined to project site only.
- There will be no change in Land use\Land cover outside the plant area.
- Proper Storm water drainage system should be provided all around the plant premises to avoid water logging.
- There is no vegetation present on the site and only of some herbs, grasses is required to clear.
- Domestic liquid waste generated during construction phase should be treated in STP.
- Debris, Scraps, excavated soil, used bags and steel waste generated during construction phase shall be disposed as per Construction and Demolition Waste Management Rules 2016.
- The excavated soil should be used for leveling the premises. Top soil shall be stacked separately and used for greenbelt development.

4.5.10. Impact on Soil Quality

Soil quality of the area may get affected due to the contamination of soil with the construction material, domestic waste, spillage of oil/fuel/paints, spillage of waste/debris, etc. However, these impacts are short term and site specific and can be minimized with the mitigation measures.

Mitigation Measures

- Drip pans shall be provided with vehicles & machinery to prevent soil contamination
- Contaminated soil (with oil) shall be removed and disposed to secured landfill site.
- Cautions shall be exercised that the used oil shall not contaminate the soil due to spillage/leaked.
- Construction material, construction waste shall be stored on designated areas, preferably on paved surface.
- Used oil /fuel shall be stored on paved surfaces in HDPE drums with provision of collection of spilled oil.
- Used oil/fuel shall be transferred with the help of pumps to minimize spillage
- Domestic waste shall be disposed in STP.
- Hazardous wastes will be stored at earmarked area with impervious flooring, shed and spillage/ leakage collection system to eliminate rainwater contamination, chances of overflow / spillages going on to the land and thus land/ soil contamination. Hazardous wastes will be disposed as per the Hazardous Waste Rules.

4.5.11. Impact on Ecology

The land identified for the proposed project is agriculture fallow land. No trees are present on the identified land hence no tree cutting is required. No RET species or scheduled -1 fauna is present within the site as well as in study area. However few grasses and herbs required clearing. Fugitive dust emission is anticipated due to site clearance, leveling work operation of construction machineries which may deposit on surrounding flora and fauna.

Mitigation Measure

- Water sprinkling shall be done at regular interval in dust generating areas.
- Providing suitable surface treatment to ease the traffic flow and regular sprinkling of water will reduce the dust generation.
- ACL has already developed a greenbelt in 4.86 ha area in existing unit. Further in proposed expansion ACL proposed to develop additional greenbelt in 5.91 ha to achieve total greenbelt in 10.77 ha area (33% of the total project area).
- Greenbelt development shall start along with the construction work.

4.5.12. Socio-economic environment

The land is already in Possessio of ACL. Hence no R&R issues are involved with the project. The other social impacts associated with project are people will get subjected to additional pollution stress, noise from heavy vehicles, road accidents, lower aesthetics of natural beauty, increase in criminal cases, etc. There is no cultural and archeological sites present with in the 300 m of the site hence an impact on the religious archeological site is not anticipated.

However, some positive impacts are also associated with the project. This expansion project will provide employment opportunities for the local people. In terms of gross economic yield will accrue on account of the project. The gross economic yield will increase through increase in high economic group and subsequent market multiplier effect and indirect employment opportunities will generate due to indirect job opportunities in the area. In this regards the project will generate direct permanent employment for 20 people and 120 contractual during operational phase. During construction phase direct and indirect employment (construction labour, Trucking industry, indigenous machinery suppliers/manufacturers and construction industry) for approx 1000 people.

Mitigation Measures

- Short term positive impacts will result in better quality of life. The project proponent/ contractors shall ensure that most of the workforce shall be engaged from the nearby villages/town.
- During the construction phase, DG sets should be operated only as a backup power at project site. Adequate provision should be made to mitigate the problem.

- The construction materials, which will be used at the project site and obtained from authorized local dealer.
- Increase in population density in core zone study area due to workforce involvement during construction phase is only for short term impact.
- The living conditions of the people in the study area will not be adversely affected.
- Environmental Cell formation to be responsible for mitigation of impacts during construction phase though they are transient and temporary.

4.6. Impacts During Operation phase

4.6.1. Impact on Air Quality

The impact on the ambient air quality of the study area due to the plant emissions has been predicted using mathematical modeling by following the guidelines developed by CPCB ("Assessment of Impact to Air Environment: Guidelines for Conducting Air Quality Modeling" Probes/70/1997-98). Atmospheric dispersion models are mathematical expressions, which attempt to describe the following processes in the order of emission release rate to atmospheric concentrations. Upon discharge to atmosphere, the air emissions from stationary sources are subjected to following physic-chemical processes:

1. An initial vertical rise, called plume rise, due to initial buoyancy & momentum of discharge,
2. Transport by wind in its direction,
3. Diffusion by turbulence, and
4. Gravitational settling of particles, chemical reaction, transformations and decomposition, deposition on vegetation and other surfaces, washout due to rain and other complex physical and chemical process.

Model used for Air quality Modelling

Gaussian plume models are best used for near-field applications where the steady-state meteorology assumption is most likely to apply. The AERMOD model was used in this study. However, prior to carrying out the air quality modelling exercise, meteorological condition during one season over the region was extensively studied. Concentrations are estimated for the critical pollutants assessed over appropriate averaging times (24 hours) based on the applicability of the National Ambient Air Quality Standards (NAAQS 2009/2005).

Emission inventory

The establishment of an emissions inventory forms the basis for the impact modelling. The emissions inventory comprises the identification of sources of emission, and the quantification of each source's contribution to ambient air pollution concentrations. An emission factor is a representative value that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant.

Particulate matter is the main pollutant of concern in the current project. Dispersion models compute ambient concentrations as a function of source configurations, emission strengths and meteorological characteristics, thus providing a useful tool to ascertain the spatial and temporal patterns in ground level concentrations (GLCs) arising from the emissions of various sources. Emission inventory of the cement grinding unit has been prepared based on the details provided in Project Report and Layout Plan. All point sources of the CGU are included for modelling. The air emission inventory is shown in Table 4.6 and details of APCs are shown in Table 4.7.

Table 4.6 : Air Emission Inventory of the Proposed CGU

Attached to	No. of Stack s	Stack height (m)	Stack dia, m	Stack temp, (K)	Stack velocity (m/s)	Stack Emission Rate (g/s)		
						PM	SO ₂	NO _x
Wagon Tripler	1	30	3.3	333	11.2	2.57	---	---
Cement Mill vent	1	44	2.8	373	18.7	2.76	---	---
Packing Plant	1	30	1.0	353	12.3	0.24	---	---

Table 4.7 : Details of the fugitive dust generation points and air pollution control system (Proposed Expansion)

S. No.	Attached with	Capacity, -m ³ /Hr	Fan flow - m ³ /Hr	Fan Kw	No. of Bag house	Fabric Type	Size of bags dia x length mm	Inlet Dust Concentration	
								Inlet PM load g/m ³	Outlet PM emission mg/Nm ³
1	Wagon Tippler	200000	230000	~400	1	Mixed felt	149x 4260	50	< 30
2	Cement Mill vent	680000	710000	~2240	1	PAN	149 x 8000	~600	< 30
3	Packing Plant	28000	32200	~45	1	Polyster Needle Felt	150 x 3600	50	< 30

Note: The point source emission; namely Cement Mill will be provided with high efficiency Bag House.

Model Input: Atmospheric dispersion models compute ambient concentrations as a function of source configurations, emission strengths and meteorological

characteristics, thus providing a useful tool to ascertain the spatial and temporal patterns in the ground level concentrations (GLCs) arising from the emissions of various sources. Increasing reliance has been placed on concentration estimates from models as the primary basis for environmental and health impact assessments, risk assessments and emission control requirements.

Dispersion modelling was undertaken to determine highest 24 hr avg incremental GLCs PM pollutant. These averaging periods were selected to facilitate the comparison of simulated pollutant concentrations with relevant air quality standards.

It should be noted that the GLC isopleths depicted present interpolated values from the concentrations simulated by AERMOD for each of the receptor grid points specified.

Prediction of concentration of pollutant is done using dispersion modelling. Software used for the current study is AERMOD VIEW. AERMET as a pre-processor was used to process meteorological data and estimates the necessary boundary layer parameters for dispersion calculations. Hourly-surface observations data (one season monitored Site Met data) were used as input for AERMET. Output file obtained from AERMET is a file of hourly boundary layer parameter estimates, and a file of multiple-level observations of wind speed and direction, temperature, and standard deviation of the fluctuating components of the wind.

Simulation results: GLCs are obtained in $\mu\text{g}/\text{m}^3$ for pollutants. Output of modelling gives concentration at uniform Cartesian receptors and discrete Cartesian receptors to get the resultant concentration with reference to baseline data. Dispersion modelling has been carried out for PM₁₀, for the different activities. Max GLC within area of 10 km considered are given **Table 4.8 & 4.9**. Isopleth showing incremental GLC of Pm is presented in **Figure 4.2**

Table 4.8 : Max. Ground Level Concentration

Pollutant	Max Concentration ($\mu\text{g}/\text{m}^3$)	Distance
PM ₁₀	7.6	0.9 km N from the source (i.e. project area)

Table 4.9 : Ground level concentration at monitored location due to proposed expansion

LOCATION	Max PM ₁₀	Incremental GLC PM ₁₀	Total PM ₁₀
AAQ 1	95.9	0	95.9
AAQ 2	91.8	1.91	93.71
AAQ 3	96.8	1.91	98.71
AAQ 4	87.8	1.13	88.93
AAQ 5	82.9	0.71	83.61
AAQ 6	117.8	4.9	122.7

AAQ 7	80.7	2.5	83.2
AAQ 8	77.9	0.96	78.86

Observation and Conclusion:

The max. GLC are observed to be in the downwind side about 0.9 km north from the source of emission which indicates the impact outside the project site boundary. The GLC will remain within the NAAQS except Jalon Industrial Area where the AAQ is already exceeding the MAAQS.

Fugitive Dust Control & Mitigation Measures

The main fugitive air pollution sources in proposed industries are VRM, silo etc. Gaseous emission like SO₂, NO_x, CO and particular matter shall be generated from process stacks and DG sets. Other emissions include fugitive emissions due to raw material handling and movement of vehicles.

Mitigation Measures

- Vertical Roller Mill will be provided with bag house of >99.9% efficiency to trap PM emission. The outlet PM concentration will be less than 30 mg/Nm³. The details of the pollution control system is given in Table 4.10.

Table 4.10 : Name of Dust Pollution Control System in CGU

Name of Unit	Air Pollution Control System
Clinker Silo	Bag Filter
Flyash Silo	On the top of Silo
Gypsum/slag/Wet flyash Stacker	Bag filter
Grinding Mill (VRM)	Bag House
Cement Silo	Bag Filter
Gypsum Crusher	Bag Filter
Rotary Packer	Bag Filter

- DG sets will be used during only power break down.
- Mechanized truck unloading/ loading system shall be provided. Raw material and finished product shall be stored in covered and paved surface.
- Sprinkling of water to control fugitive dust emission.
- Speed of vehicles inside the factory premises will be controlled.
- Greenbelt will be maintained to attenuate the air pollution.
- Proper personal protective equipment will be provided to the workers.
- Dust collectors will be in line with unloading hoppers.
- All the trucks being used for transportation of raw material and final product shall be checked for "Pollution under Control" certificate prior to their entry to the plant premises.

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

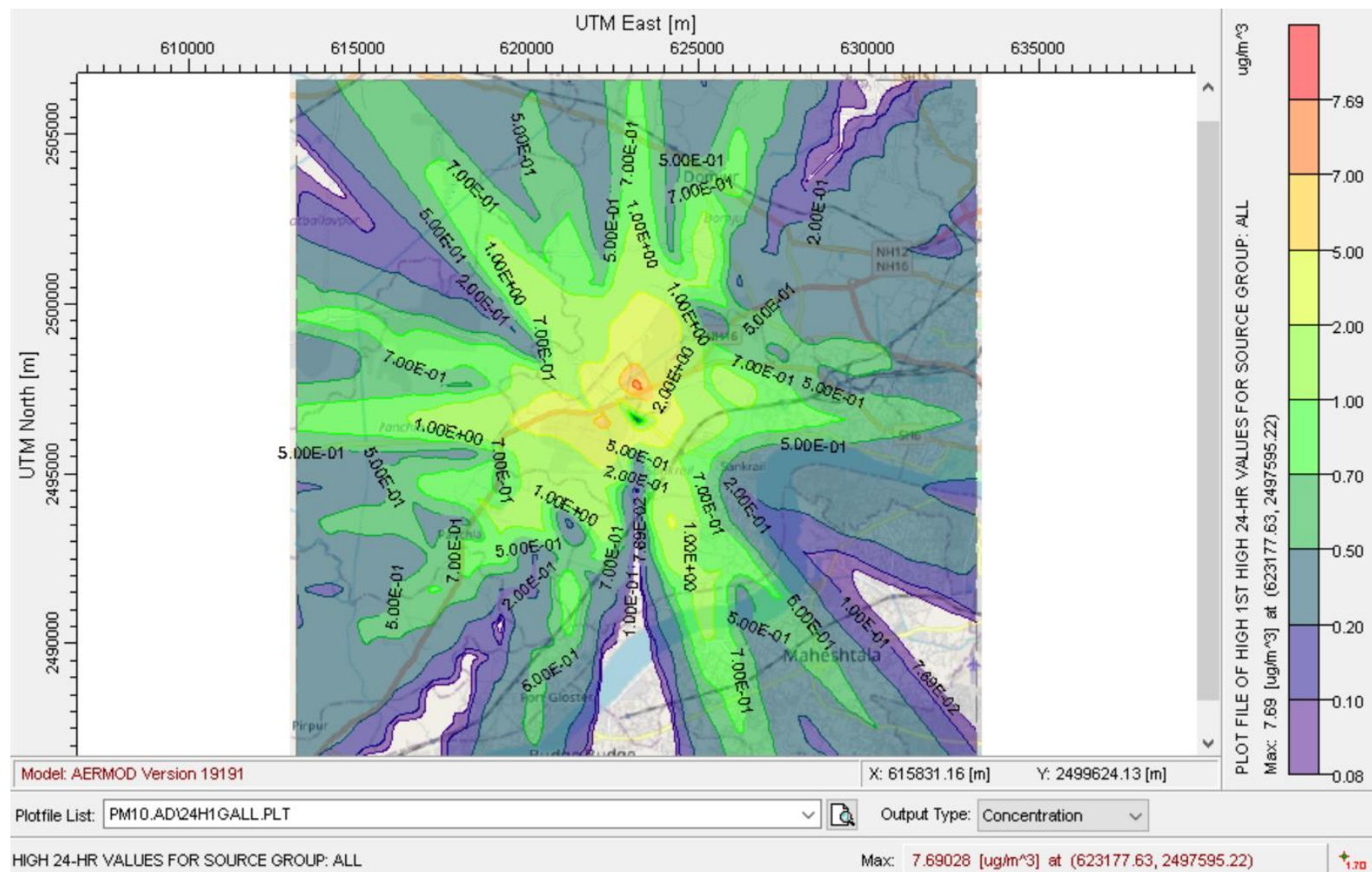


Figure 4.2 : Predicted GLC of PM10

4.6.2. Impact on Noise Quality

Noise Impact Prediction: Noise shall be produced during crushing and milling and also due to use of dumpers and DG sets. With increasing distance from the source the noise level decreases due to wave divergence. Additional decrease also occurs due to atmospheric effects and interaction with objects in the transmission paths. For hemispherical sound wave propagation through homogeneous medium, noise levels at various distances can be predicted using a model based on the following principle:

$Lp2 = Lp1 - 20 \log (r2/r1)$, where $Lp1$ and $Lp2$ are the sound levels at points located at distance $r1$ and $r2$ from the source. Combined effect of all the sources (A, B, C... etc) can be determined at various locations by the following equation:

$10 \log (10^{Lpa/10} + 10^{Lpb/10} + 10^{Lpc/10})$, where Lpa , Lpb and Lpc are noise pressure levels at a point due to different sources.

Based on the above principle, Noise Model has been developed where noise levels can be predicted at any distance from the source for simple flat terrain. Attenuation factors are not applied hence the modeled results are overestimate.

The maximum noise expected from the plant is 94.6 dBA (from cement mill at 1 m distance from source). Other noise levels will be around 85 to 94 dBA. **Figure 4.3** shows the noise contours at distance 100 m, 200 m, 300 m, 400 m, 500 m from 94.6 dBA source strength.

At 200 m distance the predicted noise values are 37.6 dBA. At 500 m distance the predicted values are 30 dBA.

Baseline Ambient Noise levels recorded at village outside the plant (1.6 km away) was found to be less than more than 30 dBA but less than 55 dBA during daytime and less than 45 dBA during night time, which is well within the permissible residential area limit. The predicted noise level at 500 m distance from source is 30 dBA. Therefore, there will be insignificant impact on the ambient noise quality of the surrounding villages.

The standards for occupational exposures - tolerable level is 90 dB(A) for 8-hour exposure. This level will be achieved inside work area through use of properly maintained machines, pumps, compressors, and vehicles. In case of overexposure found inside working area, workers will be provided with ear plugs/ earmuffs for use so that the exposure is minimized / brought to acceptable level.

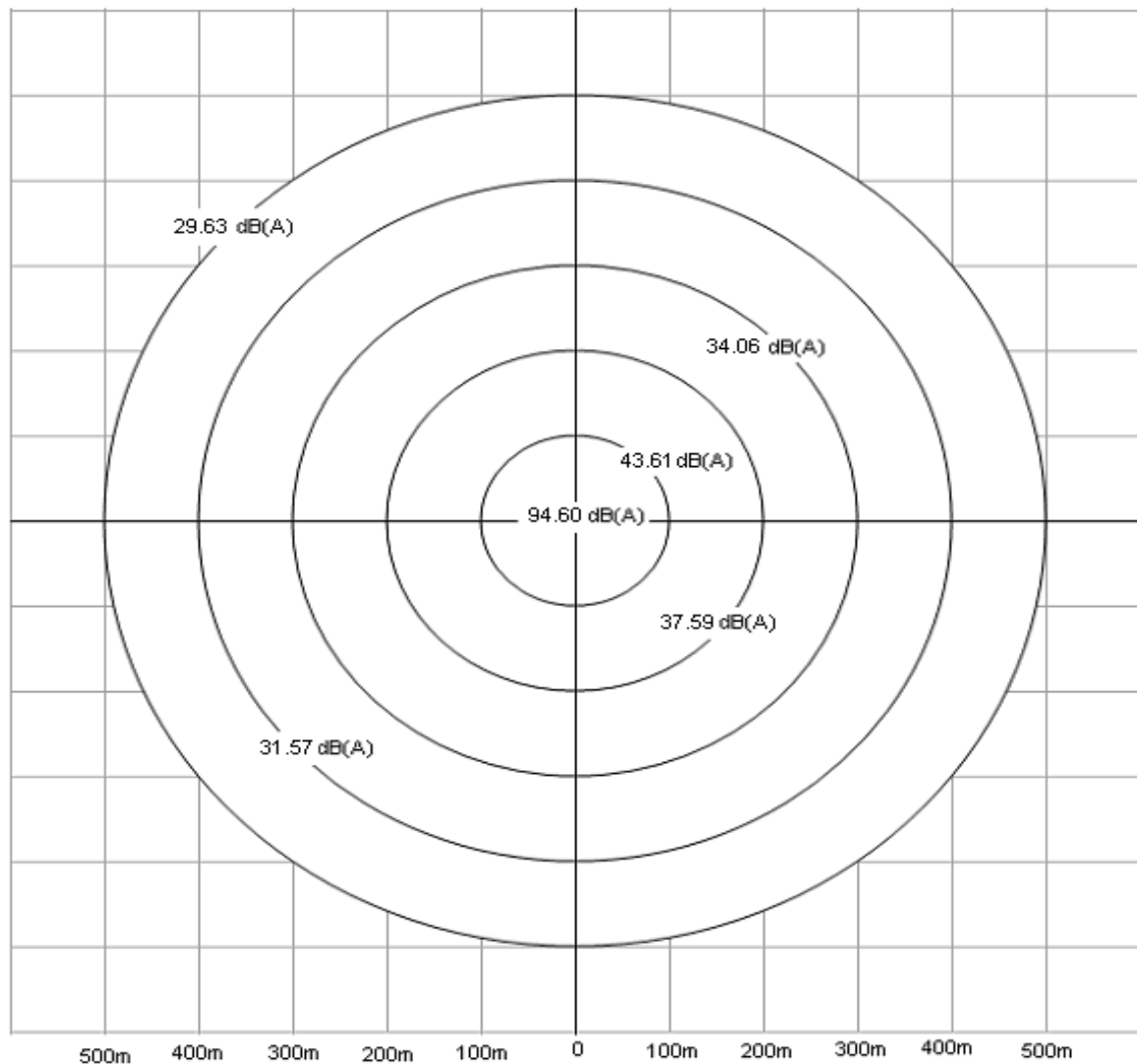


Figure 4.3 : Predicted Noise Level– (source strength 94 dBA)

Mitigation Measure

- Acoustic enclosures shall be provided wherever required to control the noise level below 85 dB(A).
- Wherever it is not possible technically to meet the required noise levels, the personnel protection shall be provided.
- Provision of plantation in available spaces, wherever feasible, will further help in reducing the noise levels.
- To protect the workers within the construction area and plant area, adequate protective measures in the form of ear-muffs/ ear plugs/ masks shall be provided, which will minimize/eliminate adverse impacts.

4.6.3. Impact on Groundwater Regime

Cement making is a dry process, where no process water is required. Only some water is required for non-contact cooling of plant machinery and for drinking purpose. Only make up water will be required for meeting the evaporation losses in the cooling circuit. For proposed expansion about 90 KLD fresh water and 40 KLD recycled water shall be required. Water required for the proposed expansion shall be sourced from ground water. Permission for water drawl is already available with ACL. As per CGWB the stage of ground water development in study area is good and all the blocks of Howrah district including study area falls in safe category.

Mitigation Measures

- The company will install roof top rainwater harvesting structures inside the plant premises to compensate the groundwater drawl as per the CGWB directions.
- Out of the total water required about 40 KLD shall be used from the treated water.
- The domestic wastewater generated from the toilets, washrooms and canteen of the plant shall be treated in STP.
- The network of storm water drains and wastewater drains inside the plant will be made separate. The storm water drain will have sedimentation pits and oil – water interceptors located at suitable points. During monsoon, the storm water will be discharge outside the premises into common drain.
- Domestic wastewater generated from plant and colony will be treated in STP of 200 KLD capacity and treated water will be used for greenbelt development / plantation.
- Plant should ensure that the treated effluent quality shall comply with norms set by SPCB.

4.6.4. Impact due to Solid waste generation

Most of the process waste generated in cement industry is reused in process.

Mitigation Measures

- Dust collected from various pollution control equipment's (Bag filters) will be recycled into the process.
- Sewage sludge generated from STP will be used as manure in greenbelt development plantation.
- Used or Spent oil will be generated as per Schedule I of Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, which will be sold to CPCB authorized recycler.
- Municipal Solid waste generated from plant canteen & colony will be collected, segregated and disposed off scientifically in compliance of Solid Waste Management Rules, 2016.
- Used Lead acid batteries will be stored in the designated storage area and will be sold to registered vendors as per Battery waste

4.6.5. Impact due on Ecological Environment

The attributes that are identified to describe ecology are animals, birds, fish, field crops, threatened species, natural vegetation etc. The biological impacts associated are discussed as below:

The impact on the surrounding ecology during the operation of the project will mainly occur from the deposition of air pollutants, discharge of untreated wastewater and solid waste generated from the proposed plant. Air pollution affects the biotic and abiotic components of the ecosystem individually and synergistically with other pollutants. Chronic and acute effects on plants and animals may be induced when the concentration of air pollutants exceeds threshold limits.

Endangered species and Contamination of Habitats: The study area does not have any identified endangered species, Forest, National Park, Sanctuaries and hence there is no question of any adverse impact on the same.

Fragmentation of terrestrial habitats: No scheduled wild fauna is present within the study area. There is no designated wildlife corridor present within the study. No scheduled wildlife habitat is present within the study. Hence the fragmentation of terrestrial habitat is not anticipated.

Disturbance of habitats by noise or vibration: being an urban area no major wildlife is recorded from the study area. The noise generated from the proposed industry may have impact on avifauna.

Mitigation Measures

- NO RET species is present within the study area.
- The incremental emission of air pollutants will not be likely to induce any significant changes in the ecology because the national ambient air quality standards will remain within the limits.
- The project is therefore planned with most efficient air pollution control systems for achieving 30 mg/Nm³ dust emission level from all the stacks.
- Further the modelling study proves that the incremental MGLC of PM, SO₂, NO_x and CO generated from the proposed plant will be very less and overall incremental GLC will remain within the NAAQS. And it will not harm the ecology of the study area.
- Most of the fugitive dust emission generation points are also fitted with efficient air pollution control systems (Plant dedusting systems).
- Water sprinkling / dry fog type system will be used at material handling points to suppress the generation of fugitive dust.
- All the wastewater generated from the plant shall be treated and reused in process and greenbelt development.
- Greenbelt development along the plant boundary, further development of gardens and lawns near admin building will mitigate the residual impact on natural resources which also create suitable habitats for avifauna.

4.6.6. Impact of Road Transportation

The site is well connected to NH - 6 (~0.2 km in NW direction) and NH - 117 (~7.5 km in ENE direction). The site is also well connected to rail. Most of the raw materials will be transported through the rail except dry flyash which will be transported through road in closed bulkers. Since cement market in local/surrounding districts, about 80% finished product (cement) shall be transported through road and 20% by rail.

Considering the above about 1452 MT/day of fly ash shall be required per day for expansion project and shall be transported through road (around 78 bulkers 30 ton Capacity) / rail depend on the availability of CFA/DFA.

Similarly about 4840 MT/day of cement shall be produced out of which 3872 MT/day shall be transported through road. For which about 400 trucks (to and fro) shall be required for transportation. Rest of 986 MT/Day shall be transported by rake. In addition some vehicles (cars and scooters) will be added due to working staff in the plant.

Baseline Traffic Survey: Road conditions and traffic volume was counted in road connecting to ACL (Munsirhat-Sankrail road) by EQMS team. The name of road whose conditions and volume was counted is given in **Table 4.11 to 4.13**.

Table 4.11 : Name of Traffic Survey Location

Point	Name of Road Stretches	Place where Classified Vehicle Count done for 24-hr
1	Munsirhat-Sankrail Road	Near ACL Gate

Table 4.12 : The existing road conditions are described below:

	Road: Munsirhat-Sankrail Road	Unit
1	Pavement/ Border width (Left side)	0.5m
2	Pavement / Border width (Right side)	0.5m
3	Carriage width	7.0 m
4	Road type/Condition	Asphalted
5	Condition	Good
6	Lane	Single (two way traffic)

Table 4.13 : Summary of Traffic Volume Count

Time	2 Wheeler	Car/Jeep/Van	Buses	Trucks/ Dumper/ Multi wheeler
7:00 AM – 11:00 AM	216	128	20	120
11:00 AM - 5:00 PM	258	146	32	98
5:00 PM - 10:00 PM	186	67	28	102

10:00 PM - 7:00 AM	38	19	4	110
Total	698	360	84	430
PCU count	349	360	185	1591
Total PCU	2485			

Traffic Impact Analysis: The site is connected to NH-6 through a 7.5 m wide road. Indian Road Congress (IRC: 64 – Guidelines for Capacity of Roads in Rural Area – Code of Practice, 1990) indicates the design service value of **15000 PCU/day** for a 2-lane road (7.5 m width) and **2000 PCU/day** for a single-lane road (3.5 m width) on plain rural terrain. Existing capacity of the 2-lane road stretches under mixed traffic conditions were studied and the PCU estimated as per guidelines of IRC. Based on above guidelines and code of practice it has been ascertained that the 2-lane road stretches is well within the design service value of 15000 PCU/day, as prescribed by the Indian Road Congress.

The current load on the **Munsirhat-Sankrail Road is estimated to be 2485 PCU which is far below the** service value of 15000 PCU/day. The additional PCU load to be added on this road due to proposed expansion will be 1673 PCU. Total load after expansion of ACL project will be 4158 PCU which is far below the carrying capacity of the road and adequate to bear the increased traffic load due to proposed expansion.

Mitigation Measures

- Provide adequate traffic signs and signages to notify residents.
- Install safety mirrors to aid visibility in conflict points.
- Prevent on street parking.
- Provide speed humps to regulate speed of vehicles on local streets.
- Provide pedestrian crossings and dedicated footpath to cater to the walking population.
- Assign traffic wardens to regulate flow of project traffic during peak hours
- Vehicle movement will be regulated inside the site with adequate roads and parking lots shall be provided.

4.6.7. Socio – Economic Environment

Due to proposed project operation and emission of dust, wastewater and solid waste generation. Improper management of waste material (Solid waste or liquid effluents) from the proposed activities may affect the local people. Due to Noise generation during the operation phase of the proposed project, local people may be adversely affected. There will be air emissions in the operation phase of the plant. Beside above adverse impact the plant will create job opportunities for the local people.

Mitigation Measures

- All possible air pollutants will be scrubbed properly by various pollution control equipments before emitting into atmosphere. The norms will be maintained through regular monitoring and analysis of gases.
- Domestic sewage is treated in Sewage Treatment Plant.
- Proposed project will affect positively the welfare of local people through direct employment opportunities during the operation phase as employees will be hired from nearby city & towns, which will improve the Socio-economic environment of the area.
- The greenbelt area development and tree plantation will help in enhancing the aesthetics of the plant area.
- All the wastewater generated from the plant shall be treated and reused in process and greenbelt development.
- Demographic profile of the area will undergo significant change. More people will come from other places in search for business and employment. More and more amenities like educational facility, health centers, recreation centers, etc. will come up in the area along with several other infrastructure facilities. Large beneficial impacts in terms of gross economic yield will accrue on account of the project. The gross economic yield will increase through increase in high economic group and subsequent market multiplier effect. The benefits accrued will be tremendous in local as well as in regional context.
- Company shall be giving preference to people from economically weaker sections for employment in various semi- skilled/unskilled jobs there by contributing to their uplift the quality of life.
- ACL has earmarked a budget of Rs. 300 Lakhs for undertaking CSR activities based on need-based analysis. This budget is for upcoming 3 years. This money will be spent for different CSR activities like agro based livelihood, women empowerment, health and community welfare in surrounding villages.
- With the implementation of the CSR budget, the living conditions will be improved due to the improvement in socio-economic conditions, employment, education, health care and physical infrastructures like roads and other facilities.

Chapter 5. ENVIRONMENT MONITORING PROGRAMME

This chapter presents a monitoring programme for pollution control at source, monitoring pollutants at receiving environment for appropriate notified parameters, specific programme to monitor safety and health protection of workers.

5.1. Environmental Monitoring Plan

Regular monitoring in a systematic manner provides information on operational performance of installed pollution control facilities, checks the extent of environmental degradation taking place and adequacy of mitigation measures applied. The monitoring plan also ensures compliance with the environmental legislation. The objectives of the monitoring plan are as follows:

- To verify the results of the EIA Report.
- To study the trend of various pollution parameters, which are identified as critical.
- To check the efficacy of pollution control equipment.
- To ensure that any additional parameters, other than those identified in the EIA, do not become critical after the commissioning of plant.

The effectiveness of monitoring program depends mainly how best the objective of the monitoring is addressed through its core elements, for example.

- Monitoring network
- Manpower and Instruments
- Parameters to be monitored
- Frequency of monitoring
- Method and duration of sampling
- Method of analysis

Environment Management Department (EMD) exist, and it will be strengthened. Following monitoring plan is suggested to verify the safeguards and pollution mitigation measures.

- Monitoring of stack emissions for temperature, velocity, flow, PM, SO₂ and NO_x, (additional HC and CO only for DG stack).
- Monitoring of Ambient Air Quality at plant boundary for PM_{2.5}, PM₁₀, SO₂, NO₂, Ni, Pb, As.
- Work Zone Air Quality Monitoring near Mill, Loading and Unloading points, etc. for PM₁₀.
- Monitoring of ground water quality of project site for pH, conductivity, total solids, hardness, chloride, sulphate, nitrate, fluoride, oil, heavy metals, etc. Observation well with piezometer shall be installed.
- Wastewater quality and quantity for pH, TSS, TDS, COD, Oil and Grease.
- Noise Level Monitoring at the plant boundary and inside work areas

- Monitoring the disposal of spent oil and grease, e-wastes and used batteries
- Green belt plantation, maintenance, development of other forms of greenery like lawns, nursery, gardens, etc. in the plant boundary.

All the above observations shall be compiled and documented by the environment management department to serve the following purposes.

- Identification of any environmental problems that are occurring in the area.
- Initiating or providing solutions to those problems through designated channels and verification of the implementation status.
- Controlling activities inside the plant, until the environmental problem has been corrected.

Table 5.1 : Name of Instruments Required for Environmental Monitoring

	Name of Instruments	Number	Purpose
1	PM ₁₀ Sampler	2	Air Quality Monitoring
2	PM _{2.5} Sampler	2	Air Quality Monitoring
3	Refrigerator	1	Preserving collected samples
3	Spectrophotometer	1	Analysis of air and water samples
4	pH meter	1	PH measurement
5	Conductivity meter	1	Conductivity measurement
6	DO Meter	1	DO measurement
7	Electronic Balance	1	Weighing
8	Oven	1	Drying
9	Desiccator	1	Desiccation
10	Stack Monitoring Kit	1	Stack Monitoring
11	Online PM Monitor	1	Cement Mill stack

5.2. Stack Emission Monitoring

Air emissions from the stacks and vents shall be monitored using Stack Monitoring Kit as per Method prescribed by CPCB. Online stack emission monitor shall be installed in the Cement Mill Stack to monitor PM. The details of grab sampling are given below:

Table 5.2 : Stack Emission monitoring Plan

Component	Location	Parameter	Monitoring & Analysis Method	Monitoring Frequency
Stack Emissions Monitoring	<p>All major stacks</p> <p>Port holes should be made on the stack (6 cm diameter, 2 Nos. at 90° to each other), provided with flange.</p> <p>Location of the port hole should be at 8 times stack diameter down stream and 2 stack diameter upstream from any flow disturbance</p> <p>Platforms with railings should be provided.</p>	<p>PM and SO₂ (for cement mill)</p> <p>PM, SO₂, NO_x, CO, and HC (for DG)</p>	<p>SPM & SO₂ – CPCB Method</p> <p>CO– Orsat Analysis</p> <p>NO_x: EPA Method</p> <p>Duration of sampling – so as to collect 500 l of flue gas</p> <p>Isokinetic sampling method using stack monitoring kit to be used</p>	Weekly

5.3. Ambient Air Monitoring (Fugitive Dust and Ambient Air Quality)

One continuous ambient air monitoring station to monitor PM_{2.5}, PM₁₀, SO₂, NO₂, wind speed and wind direction shall be installed inside plant premises (at EMD Building). Ambient air of the premises (upwind and downwind of fugitive dust generating point like unloading point / stock yard / packing plant / silo, etc.) shall be monitored using HighVolumeSampler as per Method prescribed by CPCB.

Ambient Air Quality Monitoring of the surrounding villages shall be done at three nearest villages by establishing permanent monitoring stations (120 degree to each other; one station at MGLC location). The monitoring height should not be less than 3 m from ground. The station should not have any obstacles around 500 m area. Station should be 500 m away from road. Monitoring should be done during the construction stage as well as during the operation stage. The sampling details are given in **Table 5.4**.

Table 5.3 : Ambient Air monitoring Plan

Component	Location	Parameter	Monitoring & Analysis Method	Monitoring Frequency
Ambient Air Quality	At 3 locations within 0.5 – 1.0 km of plant (120 degree to each other; at human settlements)	PM _{2.5} PM ₁₀ SO ₂ NO ₂ CO As Ni Pb	PM ₁₀ , PM _{2.5} , SO ₂ NO ₂ CPCB Method Duration of sampling – 24 h Sample volume – Not less than 1100 lit/minute	Quarterly

5.4. Equipment and Ambient Noise Monitoring

Noise monitoring shall be done at all work areas inside the workplace, plant boundary and surrounding villages. The details of noise monitoring are given in **Table 5.5**.

Table 5.4 : Equipment and Noise monitoring Plan

Component	Location	Parameter	Monitoring & Analysis Method	Monitoring Frequency
Plant Noise Levels	Plant Boundary (4 sides), Equipment and Work Place (all units)	Average Leq values and Maximum value of Sound Pressure Level in dB(A)	CPCB method using equipment as per IS-9989 & IS:9779	Monthly
Ambient Noise Levels	Two nearest villages outside the plant	Leq values in dB(A)	CPCB method using equipment as per IS-9989 & IS:9779	Monthly (day & nighttime)

5.5. Water and Wastewater Quality Monitoring

Water and wastewater monitoring shall be done at Observation wells and STP inlet and outlets respectively. Surface water sample shall be collected from Hoogly river and shall be checked regularly. The details of sampling plan are given in **Table 5.6**.

Table 5.5 : Water and wastewater sampling Plan

Component	Location	Parameter	Monitoring & Analysis Method	Monitoring Frequency
Wastewater Quality	From Inlet and outlet of Sewage Treatment Plant	Flow, pH, TDS, TSS, O&G, BOD, COD, Coliforms count	APHA Method	Weekly

Groundwater Quality	Observation wells inside plant Groundwater of all villages around the plant	Ground water Level pH TDS TSS Total hardness Fluoride O&G Heavy metals	Standard Methods of APHA	Once during pre-monsoon and once during post monsoon
Surface Water Quality	Hoogly river	pH TDS TSS Total hardness Fluoride O&G Heavy metals BOD COD Coliforms Count	Standard Methods of APHA	May and November each year

5.6. Solid Wastes Monitoring

STP Sludge, dust, packaging materials, empty drums, soiled cotton materials, garbage from plant comprises solid wastes. The solid wastes are categorized as Hazardous Wastes if they are mentioned in the Schedule of Hazardous Wastes Notification or after analysis the constituents were found to exceed the threshold limit prescribed in the Hazardous Wastes Notification. Spent oil and lubricants generated from various process equipment, machines, vehicles, instruments, oil storage tanks, are categorized as Hazardous Wastes under the Notification. Used Batteries and e-wastes are also categories as hazardous wastes. Authorization for handling hazardous wastes shall be obtained from West Bengal Pollution Control Board. The monitoring plan is given in **Table 5.7.**

Table 5.6 : Solid waste Monitoring Plan

Component	Location	Parameter	Monitoring & Analysis Method
Solid Wastes	STP sludge	SiO ₂ , Al ₂ O ₃ , Fe ₂ O ₃ , CaO, MgO, MnO, FeO, organic matter and toxic metals	CPCB Method.
Spent Oil and Lubricants	From all units of the plant	It is categorized as hazardous wastes	The quantity should be recorded. It should be stored in drums, properly sealed and stored in earmarked place for auction to Authorized re-processors Records of sale should be kept and annual returns should be submitted to WBPCB

Used Batteries and e-wastes	Vehicles and computers	It is categorized as hazardous wastes	The quantity should be recorded. It should be stored in earmarked place for auction to Authorized re-processors Records of sale should be kept and annual returns should be submitted to WBPCB
-----------------------------	------------------------	---------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

CHAPTER 6. ADDITIONAL STUDIES

This Chapter provides the details about the Quantitative Risk Assessment and emergency plan as proposed for the proposed project.

6.1. Risk Assessment

Broadly, following types of possible risk/ hazards are encountered in the Industrial Units and their safeguards are suggested as under:-

- 1) Physical Hazards like burns, heat, humidity, noise etc.
- 2) Electrical Hazards like unsafe equipment, unsafe work practices, unsafe environment.
- 3) Mechanical Hazards like machinery having moving parts.
- 4) Damage due to lightening, earthquake and landslides
- 5) Fire emanating from different sources and due to different causes.

The study area is monotonously flat, having no chance of landslides. The study area falls under seismic zone III, with moderate risk. No earthquake of magnitude 6 and above has been recorded in the study area in the last 150 years.

6.1.1. Physical Hazards

Heat: Heat is the most common hazards in the industries especially where furnace is used. Its continuous exposure causes heat, exhaustion, and heat cramps. Thus, for safety of the workers, reasonable temperature which is normally acceptable in working area should be maintained, which is about 70° F to 80° F and could be achieved by proper ventilation. Otherwise, job rotation for overexposed persons shall be practiced.

Electrical Hazards: Most electrical accidents occur from one of the following factors:

- a) Unsafe equipment
- b) Unsafe environment
- c) Unsafe work practices

Electrical accidents could, therefore, be prevented through use of:

- Proper Insulation
- Guarding
- Earthing
- Electrical protective devices

Insulators: Insulators such as glass, mica, rubber, or plastic used to coat metals and other conductors help stop or reduce the flow of electrical current. This helps prevent shock, fires, and short circuits. Before connecting electrical equipment to a power source, it's a good idea to check the insulation for any exposed wires for possible

defects. Insulation covering flexible cords such as extension cords is particularly vulnerable to damage. No live wires shall be allowed to hang at any place, where persons can normally go.

Guarding: Guarding involves locating or enclosing electrical equipment to make sure that people don't accidentally come into contact with its live parts. This should be done for equipment with exposed parts operating at 50 volts or more especially where it is accessible to authorized people, qualified to work with it. The recommended locations are room, vault or similar enclosure, a balcony, a gallery or elevated platform. Sturdy permanent screens also can serve as effective guards. Conspicuous signs shall be displayed at the entrances to electrical rooms and similar guarded locations to alert people to the electrical hazards and to forbid entry of unauthorized persons. These signs may contain the word "Danger", "Warning" or "Caution" and beneath that appropriate concise wording that alerts people to the hazard or gives an instruction such as, " Danger / High Voltage / Keep Out" should be given.

Earthing: Earthing is a tool, or an electrical system means intentionally creating a low resistance path that connects to the earth. This prevents the buildup of voltages that could cause an electrical accident. Earthing helps to protect the operator as it provides an alternative path for the current to pass through from the tool or machine to the ground and does not affect the operator.

Safe Work Practices: Electrical accidents are largely preventable by adopting safe work practices such as:

- Checking Insulation of the equipment before installation
- Properly earthing the equipment
- De-energizing electrical equipment before inspection or repair
- Keeping electrical tools properly maintained.
- Using appropriate protective equipment such as:
 - a) Rubber insulating gloves
 - b) Hoods
 - c) Sleeves
 - d) Matting
 - e) Line Hose
 - f) Protective Helmets
 - g) Protective Eyeglasses

6.1.2. Mechanical Hazards

Protruding and moving parts of machinery are big hazards/ risk factors in Cement grinding Units. Proper guarding shall be provided in such areas and sufficient space for proper movement should be avoided to avoid any accident.

Lightening: Tall buildings are prone to lightening strikes especially during rainy seasons which can not only damage the building but can result in fatal accidents for workers.

It is, therefore, necessary that to avoid lightening strikes, causing any damage, lightening arresters should be provided with proper earthing as per the electricity rules in all the buildings individually.

Fire: Fires may break out in factory where furnace, electrical heaters and other equipment are used extensively. To meet such exigencies, adequate fire extinguishers shall be provided at suitable places with suitable hydrants. Water storage tanks shall be provided and kept always full of water so that during emergency the same could be utilized. These tanks should be accessible by road for the fire tenders. Supervisory staff should be fully aware and given adequate training for meeting such exigencies. First aid shall be available nearby for affected persons.

6.2. Disaster Management Plan

Despite of all efforts made accidents do occur which need immediate attention. The risks involved in this project have been identified and their mitigation measures have been delineated in earlier paras. But when serious accidents occur & negligence could result in loss of life the whole thing has to be handled in a systematic well-planned manner Accordingly following plan of disaster management has been evolved: -

6.2.1. Major Activities

Broadly Disaster Management Plan covers the following activities:

- Pre - Emergency Preparedness
- Emergency actions
- Post Emergency activities

These activities are aimed at facing any emergency so that at the required time there is no chaos, and everything is handled in a very effective manner.

6.2.2. Pre-emergency Preparedness

The activities falling in this category are carried out in a normal situation without any reference to any accidents/hazards. They are of a precautionary nature. These normally include:

- i) Internal safety
- ii) Fire fighting system testing
- iii) Mock drills
- iv) Training
- v) Communication
- vi) Emergency lights
- vii) Emergency control Room
- viii) Assembly points
- ix) Liaison with state authorities, fire brigade and hospital

6.2.3. Emergency Time Activity:

During emergency the staff at various levels is expected to work in coordinated manner with pre-assigned duties to meet the emergency situation and bring normalcy with the help of the resources available within and outside the premises. Availability and correct use of different means of communication and control is very important during emergency time. Duties of the various persons shall be defined properly.

6.2.4. Post Emergency Procedures:

After the emergency is over investigations are required to be made to establish the reasons for emergency and preventative measures needed for future happenings. These activities include:

- Collection of records
- Conducting enquiries
- Making insurance claims, if any,
- Preparation of enquiry report and suggestion
- Implementation of enquiry report and recommendations.
- Rehabilitation of affected persons.

6.2.5. Emergency Plan

This includes following actions:-

Site Layout: Site plan of the plant will be kept at a conveniently approachable place. The plan will show the storage site of the various materials alongwith the details of the surrounding areas. This gives a layout of the buildings and other facilities like roads, open and work areas etc.

Emergency Control Centre: The Control Centre will be established within the premises which will be marked on the site plan. It will be the focal point from where all operations to handle the emergency will be directed and coordinated. It will have internal and external telephone communications alongwith list of essential telephone numbers and list of key persons and their addresses.

Assembly Point: Assembly area will be earmarked for the people to get together in case of emergency which will be away from material storage. A list of all the employees/ residents will be available at this site so that their roll call could be taken and missing person, if any, could be located.

Emergency Alarm System: An audible emergency alarm system will be installed in the premises. It will be operated from at least 4 different points spread over the entire area and clearly marked as "Emergency Area Switch". The system will be tested regularly. The alarm will signify to the persons & staff that the emergency has occurred and emergency services should be put in operation. The Public Address System will also be activated and specific instructions for eventualities will be passed on to the staff working at site.

6.2.6. Service & Control:

- A. **Emergency Services:** This includes firefighting, First Aid and rescue teams. Alternative source of power supply for operating fire pumps and communication with local bodies and fire brigade, etc shall be given.
- B. **Control Centre:** The control centre could be either in Security room or Fire Station and shall have:
- Adequate No. of Internal and external telephones.
 - Layout Plan of the colony buildings showing:
 - Sources of safety equipment.
 - Fire hydrant system and alternate supply source
 - Stock of other fire fighting materials
 - Assembly points & first aid centers.
 - Surrounding habitation within ½ km distance.

Additional work plans which may illustrate during emergency

- areas affected / endangered
- deployment of emergency vehicles and personnel
- Areas where particular problems arise, e.g. fractured pipe-line.
- Areas evacuated.

It would be useful if these plans be covered with plastic/glass sheets on which felt ink markings can be deciphered.

- Normal roll of employees.
- List of key persons and their addresses with telephone numbers.
- Note pads, pencils, etc to record messages received and instructions to be passed on through runners.
- A tape recorder on which the incident and actions, being taken and progress could be recorded.
- Roll call – Roll Call board listing the names of all person's department wise and shift wise should be placed in the allocated places called assembly points. All personnel including visitors and contractors except those who are detailed to fight emergency to man such services, shall proceed to such allocated points as soon as an evacuation is ordered over PAS or orally by the section in charge and roll call taken. Section incharge should see that these boards are always kept up to date. The assembly point incharge shall report to control room immediately any absentee/unaccounted for persons. He will also keep the group until advised to move or return to work by the site controller or any other person pre-nominated by him.
-

6.2.7. Key Personnel and their Duties

Following persons will be designated for emergency situation.

- Site Controller
- Incident Controller
- Personnel / Administrative Managers
- Communication Officers
- Telephone operator
- Engineer Incharge and Electrician
- Fire pump attendants
- First Aid

Their roles and responsibilities are given below:

1. **Site Controller:** Plant Head or his nominated deputy will retain overall responsibility for the premises and its personnel. As soon as he is informed of the emergency, he shall proceed to the control room and meet the communication officer. His duties shall be:
 - Assess the magnitude of the situation and decide if people need to be evacuated from their assembly points.
 - Exercise direct operational control over areas other than those affected.
 - Maintain a continuous review of possible development and assess, in consultation with incident Controller and other key personnel, as to whether evacuation of persons is required.
 - Liaise with senior officials of Police, Fire Brigade, Medical provide advice on possible effects on areas outside the factory premises.
 - Control rehabilitation of affected areas on discontinuation of emergency.
 - Issue authorized statements to news media and ensures that evidence is preserved for enquiries to be conducted by statutory authorities.
2. **Incident Controller:** Manager or Officer of similar rank nominated will act as Incident Controller. On hearing of an emergency, he will rush to the incident point and take overall charge and report to site controller. On arrival he will assess the scale of emergency and decide if major emergency exists or is likely and inform the communication officer accordingly. His duties will be:
 - i. Direct all operations within the affected area with the priorities for safety of personnel minimize damage, property and environment and minimize loss of materials.
 - ii. Pending arrival of Site Controller, assume the duties of his post and in particular:
 - iii. Direct the evacuation of the persons from areas likely to be adversely affected by the emergency and
 - iv. Ensure that all key personnel and outside help are called in.
 - v. Provide advice and information to the Fire and Security officer and the local Fire Service as and when they arrive.
 - vi. Ensure that all non-essential workers / staff of the areas affected are evacuated to the appropriate assembly points and the areas are searched for casualties.

- vii. In the event of failure of electric supply and thereby PAS and Internal telephones, set up communication point and establish contact with Emergency Control Centre.
 - viii. Report on all significant developments to the communication officer.
 - ix. Have regard to the need of preservation of evidence so as to facilitate any enquiry into the causes and circumstances which caused or escalated the emergency.
3. **Personnel / Administrative Manager:** He will also work as Liaison Officer and will be stationed at the main entrance (Gate House) during the emergency. He will under the direction of the site controller, handle police, press and other enquiries, receive reports from roll-call leaders from assembly points and pass on the absentee information to the incident controller. His responsibilities shall include.
- i. To ensure that casualties receive adequate attention / to arrange additional help, if required, and inform relatives.
 - ii. To control traffic movements into the premises and ensuring that the alternate transport is available when need arises.
 - iii. When emergency is prolonged, arrange for the relief of personnel and organize refreshments / catering facility.
4. **Communication Officer:** He will, on hearing the alarm, proceed to Control Centre and maintain communication with the Incident Controller. He will: -
- i. Advise the Site Controller of the situation, recommending (if necessary) vacation of persons from assembly points.
 - ii. Recruit suitable staff to act as runners between the Incident Controller and himself if the telephone and other system of communication fail due to whatsoever reasons.
 - iii. Maintain prior agreed inventory in the control centre.
 - iv. Maintain a log of the incident on tape.
 - v. In case of prolonged emergency involving risk to outside areas by wind-blown materials – contact local meteorological office to receive early notification of changes in weather conditions.
5. **Telephone Operator:** On hearing the emergency alarm, he will immediately contact site controller and on his advice call the local Fire Brigade or mutual aid scheme members. In case the PAS, Internal / external telephone system becomes inoperative he shall inform the Communication Officer through a messenger / runner. In case fire is detected and the alarm is not in operation, he shall receive information about location from the person who detected the fire and thereafter immediately consult the Incident Controller and make announcement on PAS or telephone telling the residents about location of the incident and to evacuate to their assembly points. He will continue to operate the switch board advising the callers that staffs are not available and pass all calls connected with the incident to the Communication Officer.

6. **Engineer In-charge and Electrician:** They will report to the scene of the incident and close the services as requested by the Incident Controller.
7. **Fire – pump Attendants:** Two persons identified will work as fire-pump attendants. On hearing the fire alarm, they will immediately proceed to pump house to ensure that pumps are operating and stand by to maintain them. At the end of emergency, they will be relieved of their duty by the Fire and Security officers.
8. **First Aid Teams:** The Manager shall keep the roll call lists for the Fire and First-aid team on duty. Roll call leaders shall check their rolls as members of the services and report for emergency duty. Names of any unaccounted-for absentees will be informed to the Fire and Security Officer. Members of the first – aid teams will report to the Incident Controller on hearing of the alarm and follow his directions.

6.2.8. Training

The promoters shall ensure that everyone employed on the premises is made aware of the risks involved and has been given adequate training on the action to be taken in case of any emergency and that provision has been made for other people, for example, visitors and contractors who may also be on the premises. Such training shall ensure that those people not involved in dealing with the emergency, leave the vicinity of the Incident and go to a place of safety. Those people needed to carry out the emergency plans shall be capable of carrying out their specified tasks. They shall be thoroughly trained, given the correct personal protective & other equipment and be adequately supervised.

Further, it shall be ensured that the plan is thoroughly tested and rehearsed. It will also be reviewed and revised on a regular basis.

6.2.9. Fire Fighting

The unit is located adjacent to Howrah city, where Local Administration has deputed adequate Fire Fighting Services. The services shall be available by making telephone call to Fire Brigade Dept.

Management of Fire: Industrial fires and explosions cause considerable damage to life and property besides impending productivity. The fundamental approach governing fire safety attempts shall be adopted to ensure that fires do not at all start in the first place and should they occur, to restrain their spread by quick detection and extinguishment.

Prevention of spread of fire: Automatic fire detection system has many advantages such as speed and reliability and is recommended for warehouses, control rooms/computer rooms and unoccupied areas with fire hazard. Depending on the nature of the occupancy and the hazard, a variety of detection systems are available.

They are activated by one of the effects of fire such as temperature rise, smoke, flame or heat and can be coupled to an alarm system which would provide visual/audible alarms at designated manned locations. They can also be designed to automatically actuate fire-extinguishing systems. The selection/installation of the detection system shall conform to the applicable National Standards.

Extinguishing Systems: Equipment for the fighting shall be chosen with care and suited to the task. Fires are classified depending on the materials involved and appropriate extinguishing agents are also recommended. Following table gives the classification/recommendation as per Indian Standard-2490. The extinguishing agents mentioned are applied to the fire using portable or fixed appliances. Such extinguishers will be provided in adequate numbers at appropriate locations and employees shall be thoroughly trained in their use.

class of fire	Description	Extinguishing medium	Indian Standard
A	Fires involving ordinary combustible materials, like woods, paper textiles, etc. where the cooling effect of water is essential for the extinction of fire	Water	934 940 6234
B	Fire in flammable liquids like oils, solvents, petroleum products, varnishes, paints etc. where a blanketing effect is essential	Foam Carbon dioxide Dry Chemical	933 2878 2171 4308
C	Fires involving gaseous substances under pressure where it is necessary to dilute the burning gas at a very fast rate with an inert gas or powder.	CO ₂ , DryChemical Powder. The best way to extinguish such fires is by stopping the flow of fuel gas to the fire. Container is kept cool with water spray.	2878 2171,4308

6.3. Corporate Social Responsibility

Social and community infrastructure and services would be provided in response to the need of communities. This will help in enhancement of the overall quality of life in the area. The company will also undertake community development in surrounding villages in the field of sport, drinking water, road development and greenbelt development in Panchayat land with consultation of the Gram Panchayat.

M/s Ambuja Cement Limited (ACL) is fully conscious of its Corporate Social and Environment Responsibility towards community as well as environment. ACL is already doing many activities under the CSR. ACL has already planned to play a leading and meaningful role in bringing qualitative improvement in the life of community and the surrounding environment. Following strategies / methodology have been adopted for social study by ACL.

- Detailed questionnaire / Interview checklist / Observation / Group discussion
- Reconnaissance surveys to observe environmental and social characteristics surrounding villages within 3 km area.
- Establishment of environmental and social baseline conditions around the project site / project affected persons
- Discussions with the local community / local bodies and identification of hot spots and issues raised by people and to understand their perceptions about the project, anticipated changes due to the proposed power plant
- Livelihood / work alteration, Agricultural dependent Rural & SC / ST communities
- Employment, Income, Cultural, Bank & Other sources of credit
- Educational Institutes & skill level
- Environment (the quality of air & water people use, the availability & quality of food they eat, the level of hazard or risk, dust & noise they are exposed to, the adequacy of sanitation, their physical safety, & their access to & control over resources.)
- Health nutritional status & well being (health is a state of complete physical, mental, social & spiritual wellbeing & not merely the absence of diseases)
- Influx of work force / Pressure on infrastructure / Roads etc
- Role of NGO (if any) in welfare & development schemes

6.3.1. CSR/CER Activities and Budget

Existing Unit: ACL has already planned to play a leading and meaningful role in bringing qualitative improvement in the life of community and the surrounding environment. ACL is already doing CSR activities in surrounding areas. ACL has expended Rs. 263.39 lakh in year 2019-2020, Rs. 157.55 Lakhs in year 2020-2021 and Rs. 152.335 lakhs in year 2021-2022 in community development under CSR activities. The details of year wise expenses done by ACL under CSR is presented in Table 6.1.

CSR/CER Budget for proposed Expansion Unit:

For proposed expansion ACL has earmarked a budget of Rs. 300 Lakhs for undertaking CSR activities based on need based analysis. This budget is for upcoming 3 years. This money will be spent for different CSR activities like agro based livelihood, women empowerment, health and community welfare in surrounding villages. Detail of proposed CSR budget is given in **Table 6.2**.

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

Table 6.1 : Details of the expenses done by ACL under CSR/CER

Sl no	Thrust Areas Program	Unit	Year 2019-20		Year 2020-21		Year 2021-22	
			Physical achievement	Total Budget expended (Rs.) (ACF + Govt/External/Project)	Physical achievement	Total Budget expended (Rs.) (ACF + External)	Physical achievement	Total Budget expended (Rs.) (ACF + External)
1	AGRO-BASED LIVELIHOOD							
1.1	Improve / Off-season Vegetable Cultivation Program (35 acres) Soil Testing, Exotic vegetables under poly house Scaffolding with Creepers, Off- season vegetables under Poly Tunnel, Vegetable seed production	Farmers	250	5.62	700	8.58	700	5.06
1.2	Aquaculture Development Program (20 acres) Composite aquaculture Catfish breeding unit or new innovations etc.)	Farmers	150	4.36	150	6.15	150	6.26
1.3	SRI Promotion (Integrated Crop Management) 400 acres Improved PoP & Critical Input Mechanized weeder / transplanter etc. demonstration of black rice	Farmers	1200	4	1000	6	1000	4.34
	Demonstration		2	1.5			3	2
1.4	Field Volunteers			4.8		5.65		7.74
1.5	Training & Capacity Building Seed production & exotic vegetable cultivation SRI cultivation & mechanization IEC & Painting in project villages FPO - group dynamics / book keeping / business plan/ mobilization, Technical & Social Support of Resource Persons Day celebration / AGP in Insurance & safety / soil testing/ govt. schemes, Capacity Building of volunteers	Farmers		8.08	5000	7.93	5000	11.84
	SUB TOTAL-AGRO-BASED LIVELIHOOD			28.36		34.31		37.24
2	SEDI-SANKARAIL					0		

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

2.1	Training Trades					0		
a	Skill Training-DDU-GKY	Batch	11	91.11	6	30.43	11	4.83
b	Skill Training-Castrol	Batch	12	22.26	4	0		
	Skill Training (NABARD & Paid/Advance Courses) Average Batch Size-20	Batch	7	17.47			9	18.79
c	Skill Training - ACF Fees based	Batch	4		9	10.65		
d	Trainers Honorarium(Spoken English & Basic Computer)			11.67		1.4		4.6
e	Training of Trainers (TOT)Capacity Building of Team			0.6		0.48		0
f	Events & Promotion/Branding/Assesementetc			2.99		0.5		0.81
	Branding & Publicity							
2.2	Human Resource					0		
a	Salary & Honorarium			10.5		7		29.17
b	Staff Travel and Vehicle Hire			1.27		0.65		0.94
2.3	Administration					0		0
a	Telephone/Mobile/Internet/CCTV			0.31		0.48		0.39
b	Stationary/Printing/Photocopy			0.42		0.36		0.53
c	Vehicle Fuel & Maintinace/Maintaince of Genset/Insurance/Field Travel Reimbursement/Safety PPE			0.24		0.48		0.35
d	Office Running Expenses & House Keeping Visitors Expenses			0.54		0.48		0.46
	Lab Upgradation and Setup, SEDI training room maintenance, furniture & fixture, LCD, CRM Software or need base etc							
D	Non Recurring							0
a	Laptop & Desktop for SEDI Projector / Camera / Chair / Table/Serviceing	Lumsum						1.99
	Sub Total - SEDI-SANKARAIL			159.38		52.91		62.86
3	HEALTH & SANITATION					0		
3.1	HCC Project, Reach out through IPC & Mid - Media Activity Only TruckersSatallite Camp / Counselling & Refer to ICTC, Condom Social Marketing, Vision Screening / Diabetes Screening / BP / TB screening, Hypertension / Oral Testing	Truckers		27.02	18000	12.68	18000	9.005

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

3.2	BCC / CLTS Camps / WASH in school & AWC Two in Each Village, NukkadNatak, Awareness Events			1		1.54		0.39
3.3	Improvement of MCHN Services / APEKSHA / Malnutrition Clinical Health Services, Monthly Meeting with Different Stakeholders. Capacity Building of Field Team Nutrition Demonstration, IFA Interventions & Anemia Interventions, amily Planning and Health Awareness Events					2.99		3.38
3.4	MHM Project							
3.5	IDH Project							0.66
	Improvement of MCHN Services / APEKSHA / Health awareness events			2				
3.6	Project Resource Remuneration, Volunteer Honorarium & Travel Support			3.09		2.47		
3.7	MDiabtes Voice Call	No.				0.36		
	Sub Total - HEALTH & SANITATION			33.11		20.04		13.435
4	WOMEN EMPOWERMENT					0		
4.1	Formation of New SHG, Six Module Training of all SHGs, Refresher Training/ New Formation	No	10	0.48	20	0.24	35	1.05
4.2	VO & Federation Formation & Strengthening	No	2	0.16	10	0.24		0.41
4.3	Exposure Visit Of SHG/Federation/VO	No	50	0.48	1	0.06	2	0.28
4.4	SHG Audit / Grading/Documentation/Survey	No		0.12	50	0.25	50	0.16
4.5	SHG Events & Stakeholder Meetings			1.63		0.62		1.53
	Credit Based Livelihood (Bank Loan to SHG)		20					
4.7	Goat & Poultry Based Livelihood Programme (NABARD Supported)	HH		11.73	250	19.81	250	10.44
4.8	Trainings on IGA/Gender/ Other Support	No.	20	1.13	13	0.85	30	1.02
	Nutrition-BCC & Kitchen garden							0.80
4.9	Field Volunteer, SHGs Sahyogani			1.92		1.94		1.64
	Sub Total - WOMEN EMPOWERMENT			17.65		24.01		16.53
5	COMMUNITY WELFARE / INFRASTRUCTURE DEVT							

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

5.1	Community Asset - Construction of Road, Drainage, Guardwall, Boundry Wall, Renovation and Furniture of School, SWM, Development of Play Ground, Children Park, Deep Tubewell, Community Centre or Any other Non Plan needs			24.89		26.28		22.27
	Sub Total - COMMUNITY WELFARE / INFRASTRUCTURE			24.89		26.28		22.27
	Total			263.39	0	157.55	0	152.335

Table 6.2 : Proposed CSR Budget for proposed expansion project

M/S AMBUJA CEMENT LIMITED (UNIT: SAKRAIL)							
5 YEARS CSR/CER PLANNING							
SL NO	CER DETAILS	5 YEAR CER PLANNING (RS)					TOTAL RS.
		1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5 th Year	
1	Water Resource Management	0	0	40000	50000	50000	140000
2	Agro Based Livelihood	900000	100000	1200000	1500000	1600000	5300000
3	Skill and Entrepreneurship Development	500000	600000	700000	900000	600000	3300000
4	Women Empowerment	400000	300000	500000	700000	700000	2600000
5	Health & Sanitation	460000	400000	400000	500000	500000	2260000
6	Rural Infrastructure Development	600000	600000	700000	500000	400000	2800000
7	Establishment	2300000	2500000	2600000	3000000	3200000	13600000
	TOTAL AMOUNT						30000000

Source:ACL

Chapter 8. PROJECT BENEFITS

Proposed project will need to offer statewide social, environmental, and economic benefits that are greater than the capital and operating costs of its implementation.

8.1. Benefits to the Country

The proposed project would have the following operational advantages:

- Land is already acquired for the project, hence no land procurement is involved
- Utilization of existing infrastructure for proposed facilities and not creating additional streets on the environment
- Increase in revenue in terms of taxes at local, state, and national level.
- Opportunity to create direct and indirect employment to several other hundreds more through multiplier effect in terms of downstream socio-economic benefits and consequent improvement in the living conditions of local population in the study area and in region.
- Increased investment on CER; etc

Revenue to Govt.: The proposed expansion project encompasses all technical, environmental and social advantages to optimize the utilization potential of scarce non-renewable national resources and also reduce the production cost of cement. The project will contribute to the financial kitty of State Government by means of several direct and indirect taxes.

Job Opportunity: During construction phase direct and indirect employment (construction labour, Trucking industry, indigenous machinery suppliers/manufacturers and construction industry) for approx 1000 people.

Existing manpower is 82 permanent and 405 contractual workers. The project will generate another around 140 people employment (permanent/contractual) during operation phase.

Improvement in livelihood of local people and Local Infrastructure: Community development activities are very important aspects for any big organization because people of the villages surrounding the plant are the indirect stakeholders. Marginal positive impact on socio-economic environment is foreseen due to direct and indirect employment, opportunity of business and social welfare taken up by the company. The mostly rural population may see development of educational, medical and infrastructural facilities.

ACL will join hands with village panchayat, district administration, government agencies as well as non-profit & non-governmental organizations to undertake various social development programmes under the banner of Corporate Social & Environment

Responsibility (CSER). Further for proposed expansion ACL has earmarked a budget of Rs. 300 Lakhs for undertaking CSR activities based on need based analysis. This budget is for upcoming 3 years. This money will be spent for different CSR activities like agro based livelihood, women empowerment, health and community welfare in surrounding villages. This will overall help to improve the quality of life as well infrastructure in surrounding areas. CSR is a countinuous process and will continue unit the project is operational.

Chapter 9. ENVIRONMENT MANAGEMENT PLAN

This chapter provides mitigation and control measures to attenuate or eliminate environmental impacts, which are likely to be caused by the proposed project. An Environmental Management Plan (EMP) has been developed to mitigate the potential adverse impacts and to strengthen the beneficial environmental impacts during the construction and operation phases. In addition to that during the operation phase, the industry will have an additional responsibility to comply with the statutory requirements as per the guidelines of Central/ State Government.

9.1. Introduction

The Environmental Management Plan (EMP) is synthesis of all proposed mitigation and monitoring actions, set to a time frame with specific responsibility assigned and follow-up actions defined. EMP is a plan of actions for avoidance, mitigation and management of the impacts associated with construction and operation stages of the project. The EMP need to be integrated in overall project planning process covering all phases of project cycles i.e, location, design, construction and operation. Management by provision of necessary safeguard in planning of the project itself can lead to reduction of adverse environmental impacts due to project. This chapter spells out the set of measures to be undertaken during project construction and operation to reduce or mitigate or bring down the adverse environmental impacts to acceptable level based on the proposed Environmental Management Plan.

The most reliable way to ensure that the plan will be integrated into the overall project planning and implementation is to include the plan as an integral component of the project. This will ensure that it receives funding and supervision along with other investment components. For optimal integration of EMP into the project, there should be link for:

- Funding;
- Management, Training and
- Monitoring

The purpose of the first link is to ensure that proposed actions are adequately financed. The second link helps in embedding training, technical assistance, staffing and other institutional strengthening items in the mitigation measures to implement the overall management plan. The third provides a critical path for implementation and enables sponsors and the funding agency to evaluate the success of mitigation measures, as part of project supervision and as a means to improve future projects. For every use discussed in the above sections, the implementing agency as well as staffing, equipment, phasing and budgeting have been presented as far as possible. All required funds will be channelled through the project authority.

9.2. Objective of Environmental Management Plan

The EMP consists of a set of mitigation, monitoring and institutional measures to be taken up during the design, construction and operation stages of the project. The EMP has been designed keeping in view of the regulatory and other requirements to ensure the following:

- Minimum disturbance to the environment and social components
- Compliance with the environmental acts, rules and guidelines of the GoI & maintaining the quality of air, water, soil and noise as per the prescribed norms by regulatory bodies.
- Compliance to the Policies and Guidelines
- Conservation of natural resources to the extent possible
- Enhancement of Project benefits for Society & Environment
- Sustainable development and operation of project

9.3. Environmental Management Plan

Major activities associated with the proposed project are clearing of the site, construction and operation of the project. A detailed environmental management plan for each activity of construction and operation phases are prepared. EMP lists the activities involved along with environmental impacts associated with each activity, suggestive impact mitigation measures, and implementation plan covering monitoring and supervisory responsibilities.

The environmental management plan is included as **Table 9.1**. In order to effectively manage the environmental management (including social management) of the project, CSR plan, greenbelt development plan, rainwater harvesting plan, Solid Waste Management Plan; Occupational Health Management Plan, Budget for Environmental Management Plan has been prepared separately and integrated with EMP. These shall be followed for effective implementation of the EMP. The monitoring and implementation of the Environmental Management Plan (EMP) will be to ensure the proper functioning of the Proposed Project. Which will include the following:

- Environmental Management Cell
- Personnel Training on Environmental Awareness Program and Safety Issues

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

Table 9.1 : Environment Management Plan during Construction and operation Phase

SL. NO.	Project Activity/Component	Environmental Issue/concern	Remedial Measure	Institutional Responsibility	
				Implementation	Supervision
	Construction Stage				
1.	Site Clearance and Leveling of site	<ul style="list-style-type: none">• Site clearance and removal of vegetation from excavation• Dust, top soil and debris generation.• Air emission and Fugitive dust emission due to operation of construction machineries• Disturbance to public• Traffic congestion & diversion	<ul style="list-style-type: none">• Excavators shall be used for construction. The excavated material (debris) shall be stacked at safe places for backfill at a later stage of construction.• To control the fugitive emission during construction phase adequate water sprinkling system will be developed in dust generating area.• All trucks/machineries used for construction should have PUC.• All the loose construction material will be transported in covered trucks/dumpers.• Regular maintenance of al the construction equipment including dumpers/trucks to prevent leakage and other emissions.• ACL has already developed a greenbelt in 4.86 ha area in existing unit. Further in proposed expansion ACL proposed to develop additional greenbelt in 5.91 ha to achieve total greenbelt in 10.77 ha area (33% of the total project area).	Contractor	ACL (Environment and safety Management Cell)
2.	Impact due to material storage debris disposal	<ul style="list-style-type: none">• Noise, dust generation• Occupational health risk• Storage and spillages of oilsand	<ul style="list-style-type: none">• Construction site shall be established within the project area and location of storage l shall be away from habitations.• Speed limits at site shall be maintained between 15-20 km/hr.• Adequate parking shall be provided	Contractor	ACL (Environment and safety Management Cell)

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

		contamination of soil	<ul style="list-style-type: none"> • Toilet shall be provided at site • Drinking water facility shall be available for workers at site • Loose construction material and waste storage area shall be paved and covered • Oil shall be stored on concreted floor with spillages and leak collection pits • Oil interceptor shall be provided in vehicle cleaning areas • All construction vehicle shall comply with traffic rules and carry PUC certificate. • First Aid Kits shall be available at construction site. • Fire extinguishers shall be installed in storage yard area • Provision for sprinklers for dust suppression shall be made • Develop system for maintaining record of waste generation and disposal 		
3	Impact on health on occupational health & Safety of workers	<ul style="list-style-type: none"> • Risk of health • Accidents/ injury to workers 	<ul style="list-style-type: none"> • Contractor shall depute environmental and safety officer to ensure compliance to EMP. • Construction/excavation activity area shall be barricaded for safety reasons. • The contractor will make sure that during the construction work all relevant provisions of the Building and Other Construction Workers (regulation of employment and conditions of services) Act, 1996 are adhered to. • All work force shall be subjected to an orientation program to familiarize them 	Contractor	ACL (Environment and safety Management Cell)

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

			<p>with work requirements, safety practices at work,</p> <ul style="list-style-type: none"> • Visitors/officials/ workers to worksite are to be provided with PPEs 		
4.	Impact on Topography and drainage	<ul style="list-style-type: none"> • Minor Change in topography and will disturb the drainage pattern of the area 	<ul style="list-style-type: none"> • Excavation activity shall not be carried out during monsoon season • Excavated areas shall be covered to the extent possible to prevent entry of rainfall run-off in case of rains • Top soil shall be stacked and used for landscaping purposes. • The earth generated during cutting shall be used for filling purpose. • No earth shall be dumped out side the project area. • Natural slope will be maintained during the site preparation to avoid any effect on the natural drainage pattern of the site. • Provision of side drain/ storm water drain shall be made all around the premises and all access roads to prevent water logging. • Sedimentation tanks shall be provided with storm water drain to arrest the sediments. 	Contractor	ACL (Environment and safety Management Cell)
5.	Impact on Air Environment	<ul style="list-style-type: none"> • Dust generation due to construction activities • Dust generation due to vehicle movement • Air emission due to machineries and DG set 	<ul style="list-style-type: none"> • Barricading of construction site. • Water sprinkling shall be done at regular interval in dust generating areas. • Providing suitable surface treatment to ease the traffic flow and regular sprinkling of water will reduce the dust generation. • Aggregates and sand will be stockpiled at suitable places (after stabilizing the surface), near the boundary wall so that the wall acts as windshield. 	Contractor	ACL (Environment and safety Management Cell)

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

			<ul style="list-style-type: none"> Necessary water sprinkling arrangement will be provided around the stockpiles and used whenever necessary to make them moist. Cement and steel will be stocked inside covered sheds. Construction equipment having 'Pollution Under Control Certificate' will be deployed during the activity to restrict the exhaust emissions. 		
6.	Impact on Noise Environment	<ul style="list-style-type: none"> Noise generation from earth moving equipment and material handling traffic High noise exposure to workers 	<ul style="list-style-type: none"> The construction activity will be carried out mostly during daytime. The construction equipment will undergo preventive maintenance test at routine intervals. Any machinery or equipment generating excessive noise levels (above 90 dBA) will be taken out of service and replaced by new ones. The noise generation will be confined within the surrounding areas of construction site. Workers exposed to noise will be given personnel protective equipment like nose masks, face shields and ear plugs. Job rotation schemes will be practiced for over-exposed persons 	Contractor	ACL (Environment and safety Management Cell)
7.	Impact on Water Quality	<ul style="list-style-type: none"> Wastewater generation Change in drainage water logging Accidental Leakage 	<ul style="list-style-type: none"> Wastewater arising from site offices, canteens and other washing facilities will be collected and treated in the existing STP and then reused for dust suppression. Oil separator / interceptor will be 	Contractor	ACL (Environment and safety Management Cell)

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

		of lubricant or spill	<p>provided near vehicle parking site, workshop and canteen to prevent the release of oil and grease into drainage system.</p> <ul style="list-style-type: none"> • The oil and grease separators will be cleaned on regular basis. • The treated water will be reused for gardening and horticulture purpose. Sedimentation pits will be provided at appropriate location to trap the silt laden runoff water and prevent excessive silt from going outside. 		
8.	Impact on land use	<ul style="list-style-type: none"> • Change in land use • Impact on existing topography and drainage pattern • Contamination of soil of due to construction material, domestic waste, spillage of oil/fuel/paints, spillage of waste/debris, etc 	<ul style="list-style-type: none"> • Change in existing Land use\Land cover from agricultural fallow land into industrial uses will be for longer duration and this change in Land use\Land cover shall be confined to project site only. • There will be no change in Land use\Land cover outside the plant area. • Proper Storm water drainage system should be provided all around the plant premises to avoid water logging. • There is no vegetation present on the site and only of some herbs, grasses is required to clear. • Domestic liquid waste generated during construction phase should be treated in STP. • Debris, Scraps, excavated soil, used bags and steel waste generated during construction phase shall be disposed as per Construction and Demolition Waste Management Rules 2016. 	Contractor	ACL (Environment and safety Management Cell)

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

			<ul style="list-style-type: none"> The excavated soil should be used for leveling the premises. Top soil shall be stacked separately and used for greenbelt development. 		
9.	Impact on soil quality	<ul style="list-style-type: none"> Contamination of soil with construction material Spillage of oil/ paint/ waste/ debris 	<ul style="list-style-type: none"> Drip pans shall be provided with vehicles & machinery to prevent soil contamination Contaminated soil (with oil) shall be removed and disposed to secured landfill site. Cautions shall be exercised that the used oil shall not contaminate the soil due to spillage/leaked. Construction material, construction waste shall be stored on designated areas, preferably on paved surface. Used oil /fuel shall be stored on paved surfaces in HDPE drums with provision of collection of spilled oil. Used oil/fuel shall be transferred with the help of pumps to minimize spillage Domestic waste shall be disposed in STP. Hazardous wastes will be stored at earmarked area with impervious flooring, shed and spillage/ leakage collection system to eliminate rainwater contamination, chances of overflow / spillages going on to the land and thus land/ soil contamination. Hazardous wastes will be disposed as per the Hazardous Waste Rules. 	Contractor	ACL (Environment and safety Management Cell)

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

10	Impact on Ecology	<ul style="list-style-type: none"> No tree are present at site few herbs and shrubs required to cut. Fugitive dust emission is anticipated due to site construction activities Traffic dust which may deposit on surrounding flora and fauna. 	<ul style="list-style-type: none"> Water sprinkling shall be done at regular interval in dust generating areas. Providing suitable surface treatment to ease the traffic flow and regular sprinkling of water will reduce the dust generation. ACL has already developed a greenbelt in 4.86 ha area in existing unit. Further in proposed expansion ACL proposed to develop additional greenbelt in 5.91 ha to achieve total greenbelt in 10.77 ha area (33% of the total project area). Greenbelt development shall start along with the construction work. 	Contractor	ACL (Environment and safety Management Cell)
11.	Traffic Management	<ul style="list-style-type: none"> Increased traffic congestion due to construction activities 	<ul style="list-style-type: none"> Traffic diversion signage shall be displayed No construction or transportation vehicle or machinery shall be allowed to park on the road beyond the marked project area Comply speed limits of the specific road while transportation of material All drivers shall carry the valid license and PUC 	Contractor	ACL (Environment and safety Management Cell)
10	Social impacts	<ul style="list-style-type: none"> High level of dust generation Direct and indirect Employment generation Accidental risk 	<ul style="list-style-type: none"> Short term positive impacts will result in better quality of life. The project proponent/ contractors shall ensure that most of the workforce shall be engaged from the nearby villages/town. During the construction phase, DG sets should be operated only as a backup power at project site. Adequate provision should be made to mitigate the problem. The construction materials, which will be used at the project site and obtained from authorized local dealer. 	Contractor	ACL (Environment and safety Management Cell)

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

			<ul style="list-style-type: none"> • Increase in population density in core zone study area due to workforce involvement during construction phase is only for short term impact. • The living conditions of the people in the study area will not be adversely affected. • Environmental Cell formation to be responsible for mitigation of impacts during construction phase though they are transient and temporary. 		
	OPERATION PHASE				
1.	Impact on Air Quality	<ul style="list-style-type: none"> • Air emission due to operation of plant and DG set • Movement of vehicles for transportation of raw materials and final products. 	<ul style="list-style-type: none"> • Vertical Roller Mill will be provided with Baghouse of >99.9% efficiency to trap PM emission. The outlet PM concentration will be less than 30 mg/Nm³. • DG sets will be used during only power break down. • Mechanized truck unloading/ loading system shall be provided. Raw material and finished product shall be stored in covered and paved surface. • Sprinkling of water to control fugitive dust emission. • Speed of vehicles inside the factory premises will be controlled. • Greenbelt will be maintained to attenuate the air pollution. • Proper personal protective equipment will be provided to the workers. • Dust collectors will be in line with unloading hoppers. • All the trucks being used for transportation of raw material and final product shall be 	ACL	ACL (Environment and safety Management Cell)

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

			checked for "Pollution under Control" certificate prior to their entry to the plant premises.		
2	Impact on Noise Quality	<ul style="list-style-type: none"> Noise generation is expected from operation of the individual industrial operation and plant macheneries. DG set operations and vehicular movement are the other sources of the noise.. 	<ul style="list-style-type: none"> Acoustic enclosures shall be provided wherever required to control the noise level below 85 dB(A). Wherever it is not possible technically to meet the required noise levels, the personnel protection shall be provided. Provision of plantation in available spaces, wherever feasible, will further help in reducing the noise levels. To protect the workers within the construction area and plant area, adequate protective measures in the form of ear-muffs/ ear plugs/ masks shall be provided, which will minimize/eliminate adverse impacts. 	ACL	ACL (Environment and safety Management Cell)
3	Impact on Water Quality	<ul style="list-style-type: none"> Impact due to water drawl Impact due to wastewater generation 	<ul style="list-style-type: none"> The company will install roof top rainwater harvesting structures inside the plant premises to compensate the groundwater drawl as per the CGWB directions. Out of the total water required about 40 KLD shall be used from the treated water. The domestic wastewater generated from the toilets, washrooms and canteen of the plant shall be treated in STP. No process effluent will be discharged outside the plant premises during non-monsoon and under normal operating conditions. The network of storm water drains and 	ACL	ACL (Environment and safety Management Cell)

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

			<p>wastewater drains inside the plant will be made separate. The storm water drain will have sedimentation pits and oil – water interceptors located at suitable points. During monsoon, the storm water will be discharge outside the premises into common drain.</p> <ul style="list-style-type: none"> Domestic wastewater generated from plant and colony will be treated in STP of 200 KLD capacity and treated water will be used for greenbelt development / plantation. Plant should ensure that the treated effluent quality shall comply with norms set by SPCB. 		
4.	Impact due to solid waste generation	<ul style="list-style-type: none"> Generation of municipal solid waste Generation of Industrial non-hazardous waste (Process waste) 	<ul style="list-style-type: none"> Dust collected from various pollution control equipment's (Bag filters) will be recycled into the process. Sewage sludge generated from STP will be used as manure in greenbelt development plantation. Used or Spent oil will be generated will be generated as per Schedule I of Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016; which is will be sold to CPCB authorized recycler. Municipal Solid waste generated from plant canteen & colony will be collected, segregated and disposed off scientifically in compliance of Solid Waste Management Rules, 2016. Used Lead acid batteries will be stored in 	ACL	ACL (Environment and safety Management Cell)

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

			the designated storage area and will be sold to registered vendors as per Battery waste		
5	Impact on Biological environment	<ul style="list-style-type: none"> Improved vegetation cover at site (positive) Impact due to dust and noise generation 	<ul style="list-style-type: none"> NO RET species is present within the study area. The incremental emission of air pollutants will not be likely to induce any significant changes in the ecology because the national ambient air quality standards will remain within the limits. The project is therefore planned with most efficient air pollution control systems for achieving 50 mg/Nm³ dust emission level from all the stacks. Further the modelling study proves that the incremental MGLC of PM, SO₂, NO_x and CO generated from the proposed plant will be very less and overall incremental GLC will remain within the NAAQS. And it will not harm the ecology of the study area. Most of the fugitive dust emission generation points are also fitted with efficient air pollution control systems (Plant dedusting systems). 	ACL	ACL (Environment and safety Management Cell)
• 6	• Impact on Socio-economic	<ul style="list-style-type: none"> Employment generation for unskilled, semiskilled and skilled workers. Development of various basic amenities Air and noise 	<ul style="list-style-type: none"> All possible air pollutants will be scrubbed properly by various pollution control equipments before emitting into atmosphere. The norms will be maintained through regular monitoring and analysis of gases. Domestic sewage is treated in Sewage Treatment Plant. 	• ACL	• ACL (Environment Management Cell)

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

		<p>emission</p> <ul style="list-style-type: none"> • Solid and liquid waste generation 	<ul style="list-style-type: none"> • Proposed project will affect positively the welfare of local people through direct employment opportunities during the operation phase as employees will be hired from nearby city & towns, which will improve the Socio-economic environment of the area. • The greenbelt area development and tree plantation will help in enhancing the aesthetics of the plant area. • All the wastewater generated from the plant shall be treated and reused in process and greenbelt development. • Company shall be giving preference to people from economically weaker sections for employment in various semi-skilled/unskilled jobs there by contributing to their uplift the quality of life. • ACL has earmarked a budget of Rs. 300 Lakhs for undertaking CSR activities based on need-based analysis. This budget is for upcoming 3 years. This money will be spent for different CSR activities like agro based livelihood, women empowerment, health and community welfare in surrounding villages. • With the implementation of the CSR budget, the living conditions will be improved due to the improvement in socio-economic conditions, employment, education, health care and physical infrastructures like roads and other facilities. 		
--	--	-------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	--

9.4. Institutional Framework for Implementation of EMP

Company is responsible for implementation of all the mitigation and management measures suggested in Environmental Monitoring Program. A separate department "Environmental Management Cell" (EMC) is established to look after all environmental related matters of the plant. The EMC supervises the reported activity from time to time for smooth implementation of Environmental Mitigation and Management measures and will take necessary actions if required. The cell acts to ensure the suitability, adequacy and effectiveness of the Environment Management Program. It also ensures to meet all the Statutory Requirements

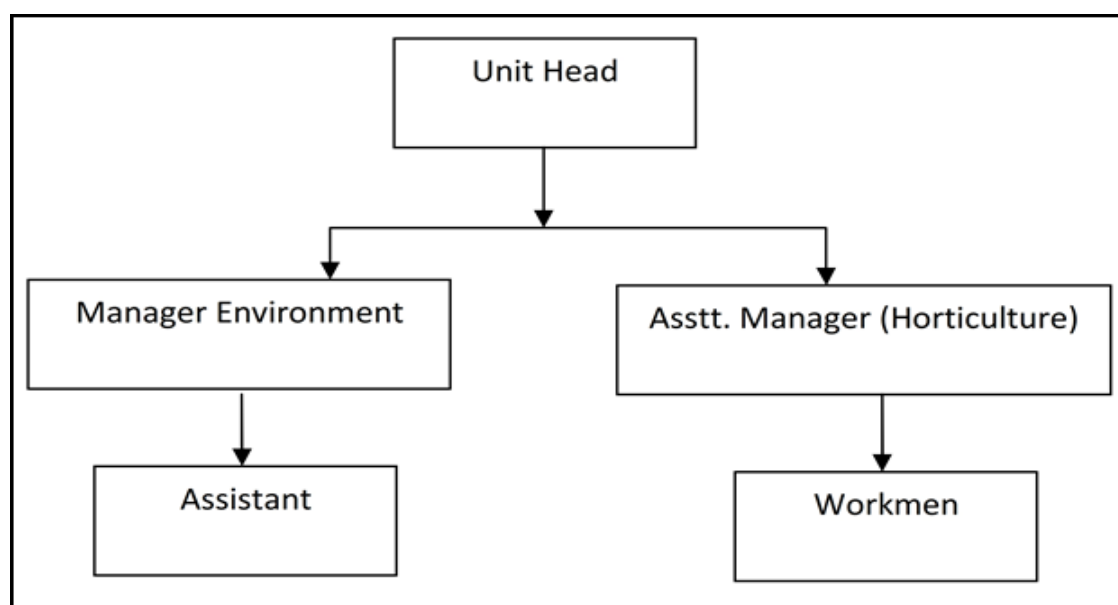


Figure 9.1 : Organization Structure of Environment monitoring Cell

9.4.2. Roles & Responsibilities of the Environment Management Cell

Functions of Environment Management Cell: Head of the EMC shall form a Consultative Working Group by involving responsible citizens from the surrounding community and develop action plans to address any grievances of the public related to environmental performance of the project and develop targets for addressing the grievances. The Cell shall thoroughly study each activities and suggest additional mitigation measures (if required) for improvement of environmental performance and discuss them in monthly meetings with the departmental HOD for implementation. The EMC shall co-ordinate all related activities such as safety, workers health, and health of surrounding community and prepare statistical records. Responsibilities of EMC are as below:

- To implement the Mitigation measures.
- To assure regulatory compliance with all relevant rules and regulations.
- To ensure regular operation and maintenance of pollution control measures.
- To initiate environmental monitoring as per approved schedule.

- Maintain documentation of good environmental practices and applicable environmental laws as ready reference.
- Coordination with regulatory agencies, external consultants, monitoring laboratories; Conducting Environmental Awareness Program for the employees on, Water management, air and noise pollution control and Energy conservation.
- Regular training to employees on Health, and Environment Topics.
- Hazardous wastes management and handling.

9.4.3. Institutional Arrangement

Ambuja Cement Ltd. (ACL) shall ensure following action items to be complied with throughout the life cycle of the project:

- Formulate/ implement Environmental Health & Safety Policy
- Document the organization structure, roles and responsibilities for implementation and for functioning of Environmental Management System (EMS) and Safety Management System (SMS) Procedures.
- Develop standard operating process and procedures to bring into focus any infringement / deviation / violation of the environment or forest norms/conditions.
- Obtain ISO 9001, 14001 and 18001 Certification
- Carry out regular inspections, monitoring and auditing.
- Carry out periodical review and issuing amendments.
- Reporting and communication (including internal and external reporting);
- Coordination with regulatory agencies, external consultants, monitoring laboratories.
- Conducting Environmental Awareness Program for the employees on, Water management, and Energy conservation.

9.5. Energy Saving Measures

Power savings methods are adopted as per energy conservation:

- Temperature sensors with visible temperature indicators in the switch boards
- Check metering at various locations to check the power consumption and power loss if any.
- Suitable rating and size cables selection to limit the total power distribution losses less than 1%
- Solar water heater for pre – heating water required for bathing and cooking.
- Use of high efficiency hybrid chillers (water and air cooled) and variable speed drivers.

9.6. Environment Policy of ACL

Concern and consciousness towards environment are embedded in our Environmental Policy which covers all our functions & operations. The structure, process and monitoring have been significantly reshaped in past few years, keeping in view the need of the time and the Company's objectives towards Corporate Sustainability. The effective execution and adherence to the policy principles are accorded high importance in the agenda of the Board of the Company. We commit to:

- Adopt environmentally safe mining and process technologies along with best operating practices for prevention & control of risks and adverse effects of the release of our pollutants to the environment (air, water, and soil) so as to protect health and safety of our employees, contract employees, and community.
- Appropriately rehabilitate/restore/reclaim mines or disturbed areas for overall benefit to community and biodiversity. Quarry rehabilitation plan will be in place for all extraction sites. A Biodiversity Management Plan will be prepared for all extraction sites according to the level of management needed based on the risks and opportunities.
- Optimise use of key resources including minerals, energy, and water.
- Conduct environmental and social impact assessment in selection of greenfield sites or major modifications in the existing sites.
- Conduct analysis of impacts our products and solutions through the Life Cycle Assessment.
- Reduce our impact on climate change by developing, manufacturing or promoting sustainable products and solutions, undertaking energy efficiency and recovery, use of renewable and non-conventional sources of energy, and utilising alternative raw materials and fuels.

- Comply with applicable legal and other requirements including environment and forest clearances, consents, permits, licenses, standards, and leading industry initiatives.
- Implement and maintain environment management systems all across our operations along with monitoring, reporting and continually improving our environmental performance.
- Be reliable provider of sound waste management solutions by co-processing qualified wastes as alternative fuels and alternative raw materials from other industries and waste service providers.
- Promote sustainable water management practices, including efficient water consumption, recycling, treatment and zero wastewater discharge, across all our operations, along with rainwater harvesting to minimize freshwater withdrawal.
- Assess the environmental practices and policies of our critical suppliers as part of selection process and expect them to respect and comply with our environmental policies and procedures.
- Develop and propagate environmental awareness amongst employees and other stakeholders including surrounding communities.
- Set corporate objectives and targets, and monitor our environmental performance.
- Conduct environmental due diligence of all new acquisitions.
- Be open, transparent, and accountable to our stakeholders regarding our environmental performance and periodic reporting. This policy will be communicated to all persons working for or on behalf of the company and will also be made available on the website of the company.

This Policy was approved by Executive Committee of the Company on 20th March 2017 and will come into force on 21st March 2017.

9.6.1. Training Requirement of Staff:

Training systems, covering the following items, shall be in place for all staff of Environment Management Cell and other staff of various departments, which cover the following:

- Awareness of the regulatory implications of the Environmental Permits for the activity and their work activities.
- Awareness of all potential environmental effects from operation under normal and abnormal circumstances.
- Awareness of the need to report deviation from the Permit.
- Prevention of accidental emissions and action to be taken when accidental emissions occur.

The staff of the EMC will be trained every year by arranging in house training programs by inviting experts or faculty members from reputed institutes.

Periodical Review: ACL will annually review the EMP and identified management action plans to address any changes in the organization, process or regulatory requirements.

Documentation and Record Keeping: The EMC will maintain following documents for effective implementation of the EMP:

- Master management system document.
- Legal Register.
- Operation control procedures.
- Work instructions.
- Incident reports.
- Emergency preparedness and response procedures.
- Training records.
- Monitoring reports.
- Auditing reports; and
- Complaints register and issues attended/closed.

9.7. Management of Construction Site

About 100 workers (contractual) will be engaged during the site preparation work. Most of workers will be taken from nearby villages. Experts and engineers will stay at Sankrail. For the workers at plant site, desired facilities at porta cabins; toilets, kitchens, adequate supply of electricity and water and other things of daily needs including the facility of first aid shall be provided. A drainage system shall be constructed to drain off all runoff water from the work site into suitable drain outlet. Temporary drainage shall maintain, removed and reinstated as required. Wastewater arising from toilets of site

offices shall be treated in modular STP. Truck loading, unloading and hauling operations so as to minimize noise impact near surrounding villages to be properly scheduled. Vehicular movement on the village roads will be avoided. Machinery that emits noise in one specific direction would, where possible be oriented in a direction away from noise sensitive receptor (human habitation). Silencers and mufflers on construction equipment, wherever required, to be properly fitted and maintained. The foundation of the every machinery shall be so designed that vibrations are minimized and isolate the every machine from each other so as to travel of vibrations from one machine to another machine. Vibrations curtailing material shall be used in the foundations. Litter disposal and collection points will be established around the all work sites. Biodegradable garbage from kitchen and tree litters will be composted and used as manure. A road roller shall also be deployed to compact the loose surface of the haul road. A water sprinkling tanker shall also be deployed to maintain the haul road surface moist at all time.

Labour Look after Plan: A brief of the measures that have been suggested for the labour under the labour management action plan (Labour including contract workers and drivers) include the following:

- Provision of common toilets and bathing facilities duly segregated for male and female labour;
- Supply of kerosene, coal/fuel wood by the contractors for their labour to prevent deforestation
- Collection of domestic waste and disposal in the onsite incinerator.
- Monthly inspection of labour camps to focus on the following:
General observations on cleanliness.
 - ✓ Drinking water availability with respect to source, cleanliness of storage tanks and quality fit to be consumed.
 - ✓ Provision of sanitation facilities to water availability in toilets their cleanliness and drainage.
 - ✓ Provision of garbage collection, segregation and disposal facilities.
 - ✓

9.8. Road Traffic Management

About 90% of the raw materials and cement shall be transported by rail rack and only 10% of the material (mainly fly ash and Cement) will be transported by road. This will be increase minor traffic on the existing roads. This would disturb local people of the area and also increase chances of road accidents. The traffic management plan includes the following elements:

- Transport management planning.
- Driver training.
- Access road maintenance.
- Vehicle management and maintenance, and
- Community liaison and safety.

The traffic management action plan covers the following aspects:

- Sourcing or recruitment of drivers and number of qualified drivers needed,
- Drivers' training and approval,
- Hours of driving and rest periods,
- Driver, vehicle and load security arrangements,
- Driver communication with control point and vehicle equipment,
- Language/communication,
- Source of suitable vehicles,
- Vehicle quality and specification,
- Vehicle management and preventative maintenance programme,
- Vehicle routes, route planning and alternative routes,
- Overall vehicle movements – access route selection and management,
- Strategic vehicle parking locations – to minimise impact of vehicles on local community, villages, roads, and Inspection and audit of the project traffic.

9.9. Human Health and Safety Plan

The objective is to ensure that the health and safety of on – site personnel is proactively managed during the construction stage of the project. Below given are the proposed project related human health and safety environmental concerns and its management.

The primary concern on potential health risks for the construction workers and other employees on site during construction are associated with drinking water quality. The project would ensure safe potable water supply to the workers on site.

- Construction site will be provided with a readily available first aid kit including an adequate supply of sterilized dressing materials and appliances. Suitable transport to take injured or sick person to the nearest hospital will be immediately provided.
- The project will ensure the safe working of all workers. Workers will be provided with safety gadgets and enforce to wear it during the construction work. This will include protective footwear, helmets and gloves to all workers employed for the work on mixing, engaged in welding works; earplugs to workers exposed to loud noise; safety belt to the labors working at higher platforms and face masks to avoid dust.
- The project will strictly follow the statutory child labor act. The project will also ensure that no paint containing lead or lead products is used except in the form of paste or readymade paint. Facemasks will be provided for use to the workers when paint is applied in the form of spray. Adequate safety measures will be ensured for workers during handling of materials at site.
- The project will comply with all regulation regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations and safe means of entry and exit.

- The project will take adequate precautions to prevent danger from electrical equipment's. No material will be so stacked or placed to cause danger or inconvenience to any person or the public.
- All machines to be used in the construction will conform to the relevant Indian Standard Code, it will be free from patent defect and will be kept in good working condition, will be regularly inspected and properly maintained as per IS provision
- To maintain hygienic conditions in the site during construction phase, suitable toilet facilities will be provided for workers separately. Also, sewage generated during construction phase will be treated in septic tank and soak pit to avoid impact on ground water.
- Work spots will be maintained clean and provided with optimum lighting.

9.10. Greenbelt Development Plan

Trees and plants are an essential component of healthy environment. In addition to maintaining the oxygen-carbon dioxide balance in the atmosphere through photosynthesis, trees and plants control air and noise pollution, control soil erosion, provide food and shelter to domestic and wild animals including birds and insects, and improve the aesthetic value of the environment. The utility of the green belt predominantly lies in its capacity to attenuate the fugitive emissions and spillage. Thus, the objectives of the proposed green belt program are as follows:

- To control air pollution due to fugitive emissions and spillage.
- To attenuate noise generated by various machines.
- To attenuate the effect of accidental release of toxic gases.
- To reduce the effect of fire and explosion.
- To improve the general appearance and aesthetics of the area.
- To provide food and habitat for wildlife.
- To control soil erosion.
- To obscure the proposed facilities from general view.

Total area available with the ACL including existing plant at Sankrail unit is 32.64 ha. Out of the total area existing Plant is located in 18.36 ha. Rest of the 14.28 ha has been proposed for said expansion. ACL has already developed a greenbelt in 4.86 ha area in existing unit. Further in proposed expansion ACL proposed to develop additional greenbelt in 5.91 ha area to achieve total greenbelt in 10.77 ha area (33% of the total project area).

Greenbelt in Existing Unit:

Ambuja Cement Ltd. (Sankrail unit) has developed a green area under 4.86 ha of land in existing unit. At present the the green belt in existing unit of ACL contains around 2463 no. of trees of different species. Details of tree species planted have been provided below in **Table 9.2:**

Table 9.2 : Details of Tree Species Planted

Sl. No	Location of tree	Common Name	No. of trees	Botanical Name
1.	Lock set area	Mehagini tree	10	<i>Swetenia mahogini</i>
2.	Lock set area	Neem tree	10	<i>Azadirac htaindica</i>
3.	Gypsum area	Krishnachura tree	1	<i>Delonix regia</i>
4.	Gypsum area	bokul tree	1	<i>Mimusops elengi</i>
5	Gypsum area	Chatim tree	2	<i>Alstonia scholaria</i>
6	Gypsum area	Sishu tree	3	<i>Dalbergi asisoo</i>
7	Gypsum area	Debdaru tree	6	<i>Polyalthi alongifolla</i>
8	Gypsum area	Arjun tree	5	<i>Terminalia arjuna</i>
9	Gypsum area	Chatim tree	1	<i>Alstonia scholaria</i>
10	Gypsum area	Krishnachura tree	2	<i>Delonix regia</i>
11	Gypsum area	Aswatha tree	1	<i>Ficusreli giosa</i>
12	Gypsum area	Banyan tree	3	<i>Ficusben galensis</i>
13	Gypsum area	kadam tree	2	<i>Anthoce phaluskadamba</i>
14	Gypsum area crusher area	Coconut tree	39	<i>Cocos nucifera</i>
15	Gypsum area crusher area	Chatim tree	14	<i>Alstonia scholaria</i>
16	Gypsum area crusher area	Banyan tree	1	<i>Ficus benghalensis</i>
17	Gypsum area crusher area	Patharia tree	4	-
18	Gypsum area crusher area	Sishu tree	10	<i>Dalbergi asisoo</i>
19	Gypsum area crusher area	Mango tree	1	<i>Mangifera indica</i>
20	Gypsum area crusher area	Thorolia tree	1	-
21	Gypsum area crusher area	Akeshpani tree	27	<i>Acacia auriculiformis</i>
22	Clinker silo area	Banyan tree	2	<i>Ficusben galensis</i>
23	Clinker silo area	Tagar tree	2	<i>Tabernaemontana divaricata</i>
24	Clinker silo area	Neem tree		<i>Azadirac htaindica</i>
25	Clinker silo area	Arjun tree	4	<i>Terminalia arjuna</i>
26	Clinker silo area	Papaya tree	26	<i>Carica papaya</i>
27	Clinker silo area	Thorolia tree	1	-
28	Clinker silo area	Aswatha	36	<i>Ficusreli giosa</i>

		tree		
29	Clinker silo area	Sishu tree	2	Dalbergi asissoo
30	Clinker silo area	java plum tree		<i>Syzygiu mcumini</i>
31	Clinker silo area	Tikagouri tree	2	-
32	DG area	Debdaru tree	9	<i>Polyalthi alongifolla</i>
33	DG area	Sishu tree	20	<i>Dalbergi asissoo</i>
34	DG area	Akeshpani tree	4	Other
35	DG area	Guava tree	1	<i>Psidium guajava</i>
36	DG area	Debdaru tree	10	<i>Polyalthi alongifolla</i>
37	DG area	Chalta tree	8	<i>Dillenia indica</i>
38	DG area	Patharia tree	9	Unidentified
39	DG area	Banyan tree	2	<i>Ficusben galensis</i>
40	DG area	Arjun tree	2	<i>Terminalia arjuna</i>
41	DG area	Chatim tree	4	<i>Alstonia scholaria</i>
42	DG area	Sishu tree	5	<i>Dalbergi asissoo</i>
43	DG area	Akeshpani tree	5	Other
Total No of trees			2463	-

Additional Greenbelt development plan in proposed expansion:

ACL has already developed a greenbelt in 4.86 ha in existing unit. ACL has proposed to develop a dense greenbelt in additional 5.91 ha area in proposed expansion. Hence, after expansion of this project, green area will increased to total **10.77 ha i.e., 33% of total plot area**. In proposed expansion additional greenbelt shall be developed in 5.91 ha area. As per MoEF&CC guidelines for tree development of around 1500 no. of trees/ha, shall planted. Thus total approx. **8,865 no. of additional trees in 5.91 ha area** shall be planted under proposed expansion to maintain green area.

Selection of tree species for Plantation: Studies have identified several optimal tree species for carbon storage, and botanists continue to experiment with new hybrids. Surprisingly, we should avoid trees such as the willow, which store comparably little carbon and emit more harmful volatile organic compounds. The tree species selected for development of greenbelt following criteria has been considered:

- Fast growing trees store the most carbon during their first decades, often a tree's most productive period.
- Long-lived trees can keep carbon stored for generations without releasing it in decomposition.
- Large leaves and wide crowns enable maximum photosynthesis.

- Native species will thrive in your soil and best support local wildlife also.
- Low-maintenance, disease-resistant species will do better without greenhouse-gas-producing fertilizers and equipment.

Guidelines and Techniques for Green Belt Development

Based on environmental conditions suitable indigenous plants species shall be planted under green belt development plan. The requirement of plants sapling for development of green belt shall be made from the nearby forest nursery. The soil characteristics shall also be kept in mind. As advance work the area to be planted shall be demarcated and pit locations marked. Pits shall be dug out and semi-filled with good and loose weathered soil before planting with the commencement of good monsoon rains sometime in month of July. The digging operation of the pit should be completed before the end of June so as to allow thoroughly weathering of the dugout soil. Prior to the commencement of the rains, pits shall be refilled with the dugout soil and FYM added. Planting shall be done when heavy showers causing run-off occurs sometime between July and August. The saplings should be 9 to 12 months old. Immediately after planting the pits shall be watered with 20 litres / pit and in case of failure of rainfall it should be watered @ 20 litres / pit at fortnight interval. The mortality of plants has been considered @ 20% and re-digging of pit should be carried out before replacement of the individual plant.

Precautions During Plantation: Some important precautions should be taken during the plantation, which are as under:

- Indigenous species recommended should be planted in sufficient numbers to increase their population size in the area.
- Multipurpose species should be planted in large numbers.

Species to be Planted under Greenbelt: The planet saving potential of trees and soils is becoming widely recognized, hence tree species having potential to removing carbon dioxide from the atmosphere shall be planted under the greenbelt development. The greenbelt development will start with construction of the plant and maximum greenbelt development shall be completed within the first year of the project development. Considering the 20% mortality rate of the tree species only 20% recovery plantation shall be done in 2nd year. Hence most of the greenbelt development work shall be carried out in first year of the project development. Considering the biographic zone following are the details of trees for proposed expansion.

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

Table 9.3 : Details of Proposed Tree Species

S. No.	Scientific name (common name)	Local/english Name	Sensitive/ Tolerant to Pollutant	Habit/ height	Crown shape / E/D Deciduous	Crown shape area	Leaf Area	Growth Rate
1.	<i>Acacia auriculiformis</i>	Akasmoni	Tolerant	Tree/ 16 m	Oblong /Evergreen	8548.22 m ²	140.50 cm ²	Quick growing
2.	<i>Albizia lebbeck</i>	Siris	Tolerant	Tree / 20 m	Spreading/ Deciduous	62509.32 m ²	272.5 cm ²	Quick growing
3.	<i>Alstonias cholaris</i>	Blackboard tree	Tolerant	Tree /15 m	Round/ Evergreen	241680.5 m ²	52.31 cm ²	Quick growing
4.	<i>Bougainvillea spectabilis</i>	<i>Bougainvillea</i>	Tolerant	Shrub / 8 m	Round / evergreen	929.25 m ²	33.15 cm ²	Quick growing
5.	<i>Cassia fistula</i>	Amaltas	Tolerant	Tree/ 12 m	Round/ Deciduous	2956.11 m ²	130.51 cm ²	Quick growing
6.	<i>Dalbergia latifolia</i>	Shisham	Tolerant	Tree/ 20 m	Round/ semi deciduous	21723.2 m ²	187.9 cm ²	Quick growing
7.	<i>Delonix regia</i>	Gulmohar	Tolerant	Tree/ 18 m	Spreading/ Deciduous	44209.23 m ²	358.32 cm ²	Quick growing
8.	<i>Ficus bengalensis</i>	Baniyan/ Bad	Tolerant	Tree/ 20 m	Spreading/ Evergreen	236493.67 m ²	119.10 cm ²	Quick growing
9.	<i>Ficus variens</i>	Fig	Tolerant	Tree/ >20 m	Spreading/ Evergreen	226285.67 m ²	116.20 cm ²	Quick growing
10.	<i>Hibiscus rosa-sinensis</i>	Gudhal	Tolerant	Shrub / 3 m	Oblong/ evergreen	61.47 m ²	44.7 cm ²	Quick growing
11.	<i>Murroya paniculata</i>	Kari patta	Tolerant	Shrub / 5 m	Round / evergreen	1354.61 m ²	35.30 cm ²	Quick growing
12.	<i>Narium indicum</i>	Kaner	Tolerant	Shrub / 5 m	Round / evergreen	5447.63 m ²	32.62 cm ²	Quick growing
13.	<i>Tectona grandis</i>	Sagon/ teak	Tolerant	Tree / 25 - 30m	oblong / deciduous	10272.14 m ²	790.37 cm ²	Quick growing
14.	<i>Syzygium cumini</i>	Jamun	Tolerant	Tree/ 20 m	Oblong / Evergreen	112143.20 m ²	77.82 cm ²	Quick growing

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

Source: Guidelines for developing Green Belts by CPCB, 2000

9.10.2. BUDGET OF GREEN BELT DEVELOPMENT (PROPOSED EXPANSION)

Approx. a budget of **Rs. 42.28 lakh (Rs. 42,28,605/-)** have been earmarked for development of 8865 nos. of trees in proposed expansion under proposed greenbelt development programme. Detailed bifurcation of the cost contribution towards green belt development has been provided in **Table 9.4**.

Table 9.4 : Budget Allocation for Proposed Green Belt Development

Total green area	5.91 Hectares					
No of trees to be planted	8,865 (On an average 1500 tree/ha considering 3x3 m spacing)					
Items	Cost per plant (Rs.)	Total cost for 1st Year Plantation in Rs.	Total cost for 2nd Year Plantation in Rs. (Considering 20% mortality rate)	Total Plantation cost 3rd year onward	Total Plantation cost 4th year onward	Total Plantation cost 5th year onward
Purchase cost of the per sapling	25	2,21,625	44,325	0	0	0
Tree planting cost/ tree	35	3,10,275	62,055	0	0	0
Watering cost (per year)/ tree	80	7,09,200	7,09,200	7,09,200	7,09,200	7,09,200
Maintenance cost (per year)/ tree	75	6,64,875	6,64,875	6,64,875	6,64,875	6,64,875
Manure/pesticides (per year)	50	4,43,250	4,43,250	4,43,250	4,43,250	4,43,250
Total expenses		23,49,225	5,49,630	4,43,250	4,43,250	4,43,250
Total Budget for 5 years	42,28,605					

9.10.3. Estimated Carbon Sequestration from Proposed Greenbelt

The rate of carbon sequestering depends on growth parameters of the plants. Density of wood of plants plays a major role. Trees act as sinks for carbon dioxide by fixing carbon during photosynthesis and storing carbon as biomass (Carbon sequestration). The net long-term carbon dioxide source/sink dynamics of green belt area change through time as trees grow, get pruned, die and decay. Trees in green belt areas sequester and store carbon as they grow. Thus, green belt influence local climate, carbon cycles, energy use and climate change. There are few methods companies will be adopting for capturing carbon emission:

- Green field technology-company will do sufficient plantation in factory campus

- Emitted carbon from boiler is designed with well-equipped Bag filter and scrubber for capturing carbons from boiler.

AMOUNT OF CARBON SEQUESTERED THROUGH GREENBELT

The rate of carbon sequestration depends on the growth characteristics of the tree species, the density of its wood, the location's conditions for growth, and the plant stage of the tree. It is greatest in the younger stages of tree growth, between 20 to 50 years. Further complicating the issue is the fact that far less research has been done on tropical tree species as compared to temperate tree species.

To calculate Amount of carbon sequestered through trees process are as follows:

1. Determine the total (green) weight of the tree.
2. Determine the dry weight of the tree.
3. Determine the weight of carbon in the tree.
4. Determine the weight of carbon dioxide sequestered in the tree
5. Determine the weight of CO₂ sequestered in the tree per year

1. Determine the total (green) weight of the tree.

Based on tree species in the Southeast United States, the algorithm to calculate the weight of a tree is:

W = Above-ground weight of the tree in pounds

D = Diameter of the trunk in inches

H = Height of the tree in feet

For trees with $D < 11$:

$$W = 0.25D^2H$$

For trees with $D \geq 11$:

$$W = 0.15D^2H$$

Depending on the species, the coefficient (e.g. 0.25) could change, and the variables D^2

and H could be raised to exponents just above or below 1. However, these two equations

could be seen as an "average" of all the species' equations.

The root system weighs about 20% as much as the above-ground weight of the tree.

Therefore, to determine the total green weight of the tree, multiply the above-ground weight of the tree by 120%.

2. Determine the dry weight of the tree.

This is based on an extension publication from the University of Nebraska. This publication has a table with average weights for one cord of wood for different temperate tree species. Taking all species in the table into account, the average tree is 72.5% dry matter and 27.5% moisture.

Therefore, to determine the dry weight of the tree, multiply the weight of the tree by 72.5%.

The average tree is 72.5% dry matter and 27.5% moisture. Therefore, to determine the dry weight of the tree, multiply the total green weight of the tree by 72.5%.

$$W \text{ (dry weight)} = 0.725 * W \text{ (total green weight)}$$

3. Determine the weight of carbon in the tree.

The average carbon content is generally 50% of the tree's dry weight total volume. Therefore, in determining the weight of carbon in the tree, multiply the dry weight of the tree by 50%.

$$W \text{ (carbon)} = 0.5 * W \text{ (dry weight)}$$

4. Determine the weight of carbon dioxide sequestered in the tree

CO₂ is composed of one molecule of Carbon and 2 molecules of Oxygen.

The atomic weight of Carbon = 12.00

The atomic weight of Oxygen = 15.99

The weight of CO₂ is C+2*O = 43.99

The ratio of CO₂ to C is 43.99/12.00 = 3.67

Therefore, to determine the weight of carbon dioxide sequestered in the tree, multiply the weight of carbon in the tree by 3.67.

$$W \text{ (carbon-dioxide)} = 3.67 * W \text{ (carbon)}$$

Amount of Carbon Sequestered Through Proposed Greenbelt: Considering a 10-year-old Greenbelt of 8865 trees and assuming the dia and tree height at the age of 10 year as per the standards, the total Carbon sequestered per year by the proposed greenbelt at its initial age will be 1015.5 tons per year. Details of the calculation is given in **Table 9.5**.

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

Table 9.5 : Amount of Carbon sequestered by Proposed Plantation

S.No	Species	Green Weight of Tree above ground level	Green weight (including root)	Dry Weight of tree	Weight of carbon in the tree	Weight of CO2	Weight of CO2 Sequestered in tree per year	No of tree proposed	Carbon sequestered lbs/year	Carbon sequestered Ton/Year
1	<i>Acacia auriculiformis</i>	1156	1387.2	1005.72	502.86	1843.636	184.3635618	560	103243.6	46.09104
2	<i>Albizia lebbeck</i>	1134	1360.8	986.58	493.29	1808.549	180.8549127	680	122981.3	54.90256
3	<i>Alstonia scholaris</i>	1936	2323.2	1684.32	842.16	3087.611	308.7611208	560	172906.2	77.19053
4	<i>Bougainvillea spectabilis</i>	22.5	27	19.575	9.7875	35.88391	3.588391125	250	897.0978	0.400491
5	<i>Cassia fistula</i>	784	940.8	682.08	341.04	1250.355	125.0354952	320	40011.36	17.86227
6	<i>Dalbergia latifolia</i>	956.25	1147.5	831.9375	415.96875	1525.066	152.5066228	670	102179.4	45.61597
7	<i>Delonix regia</i>	2200	2640	1914	957	3508.649	350.86491	720	252622.7	112.7784
8	<i>Ficus bengalensis</i>	3168	3801.6	2756.16	1378.08	5052.455	505.2454704	1050	530507.7	236.8346
9	<i>Ficus variens</i>	2420	2904	2105.4	1052.7	3859.514	385.951401	1200	463141.7	206.7603
10	<i>Hibiscus rosa-sinensis</i>	5.4	6.48	4.698	2.349	8.612139	0.86121387	230	198.0792	0.088428
11	<i>Murroya paniculata</i>	5.4	6.48	4.698	2.349	8.612139	0.86121387	400	344.4855	0.153789
12	<i>Narium indicum</i>	12	14.4	10.44	5.22	19.13809	1.9138086	200	382.7617	0.170876
13	<i>Tectona grandis</i>	1944	2332.8	1691.28	845.64	3100.37	310.0369932	1120	347241.4	155.019
14	<i>Syzygium cumini</i>	956.25	1147.5	831.9375	415.96875	1525.066	152.5066228	905	138018.5	61.6156
								8865	2274676	1015.484

Note: The above calculations are based on assumption. It is recommended that after maturation of the greenbelt/ after 10 years of maturation of the greenbelt an actual carbon sequestrations study shall be carried out to know the actual amount of carbon to be sequestered per year by the proposed greenbelt.

9.11. Rehabilitation and Resettlement Plan

The proposed expansion in cement production capacity will be done within the existing plant premises & additional land available with the Ambuja Cement Limited (ACL). Total area available with the ACL at Sankrail unit is 32.64 ha. Out of the total area existing Plant is located in 18.36ha. Rest of the 14.28 ha has been proposed for said expansion. The land is already in possession of ACL hence no R&R issues involved with the project.

9.12. Risk Management

Risk analysis has been done and details are provided in **Chapter 6**. Following maximum credible risks were identified in the plant:

	Activities	Magnitude of Risk		Description of Risk
		Severe	Not Severe	
1.	Fire hazards	-	X	Fire in plant, transformer, etc.
2.	Road accidents		X	Accidents due to truck movement
3.	Mechanical accidents		X	Accidents due to human error

Risk mitigation measures have been described in **Chapter 6**. A separate Safety Cell shall be constituted. The Head of the cell shall directly report to the plant head. All necessary risk mitigation measures shall be implemented by the Safety Cell. Qualified and experienced staff shall be recruited in the safety cell who is aware of the safety aspects and design of all equipment and structures related to the plant. The cell shall conduct mock drills on yearly basis and review the risk management plan. If required the mitigation measures shall be updated. The Emergency Response Plan / Disaster Management Plan shall be finalized after plant is ready for commissioning and staff has been recruited. The plan shall include the updated telephone numbers of the designated staff, local administration, police, hospital, WBPCB, panchayats, etc.

Following statutory provisions shall be complied by :

- The MSIHC Rules, 1989/2000 notified under the Environment Protection Act, 1986.
- Rules on Emergency planning, Preparedness and Response for Chemical Accidents, 1996.
- Hazardous Wastes (Management and Handling Rules) 2000
- Factories Act, 1987 (Amended)
- Public Liability Insurance Act, 1991
- Air Act, 1981 and Water Act, 1974

Emergency Response Plan: It includes the emergency preparedness of the installation like

1. Working on-site emergency plan
2. Fire protection system in terms of fire water storage, hydrant, sprinkler, foam, fire alarms, smoke detectors and gas detectors
3. Emergency power
4. First aid, emergency vehicle and medical provisions
5. Back-up communication
6. Training and mock drill
7. Personnel Protective Equipment and Self contained breathing apparatus

Management System: It includes the management commitment within the organization.

1. Existence of professionals in key factory positions
2. Safety, health and environment function
3. ISO 14000 and ISO 9000 certification, Occupational Health & Safety Policy (OHSAS 18001-2001)
4. System for recording near miss and accident investigation
5. Workers awareness of hazards involved

Operation and Maintenance System: This includes

1. Existence of SOP for all critical operations
2. Earthling system
3. Preventive maintenance system
4. System for implementing plant modifications

9.13. Occupational Health Management

The existing Occupational Health Cell will be strengthened. The cell will have an OHC and an ambulance with all first aid facility, driver and a paramedical staff. The Head of the Cell shall directly report to the GM / Factory Manager. Testing / diagnostic, emergency operating and recuperating facilities and services of Medical Officers, and other paramedical staff shall be outsourced. The cell shall maintain health check-up records of workers on yearly basis and review / analyse the health information.

Medical check-up of all the employees will be done during the pre employment time and thereafter at periodic intervals (under occupational health surveillance program to be done every year). Health records will be maintained for each employee for a period of 5 years. Over a period of time the health records will indicate if there is any adverse occupational impact on the employees. During employment the workers will be made aware of the process and associated hazards through audio-visual aids and conducting workshops where safety experts will demonstrate the precautionary methods.

Slogans and signboards will be placed at prominent places to make the workers aware of occupational health hazards and necessity of using safety procedures and use of personal protective equipment. Pamphlets and leaflets will be distributed to the workers and surrounding villagers, emphasizing the need of awareness building about health impacts due to dust exposure.

Dust exposure shall be monitored and kept below 2 mg/m³ (containing <5% quartz). Vector diseases (Malaria, filarial, dengue) that could grow and multiply in accumulated / stagnant water are other diseases that could affect the health of workers. The stagnant water provides favorable breeding conditions for mosquitoes and snails. ACL will make regular field surveys and take necessary actions to curb the disease if found thriving in the area. Following measures will be taken to ensure health & safety of employees:

- Information regarding health hazards expected to occur shall be given by experts (i.e. Doctors, occupational health experts).
- Information regarding various safety equipment, which can be used to minimize the health hazards, shall be given.
- Action plan during any risk shall be discussed with the employees.
- Diagrammatic sketches and slogans shall be used to describe health & safety measures, hazards

Details of Occupational Hazards in the Cement Plant: Exposure to noise and dust are the occupational hazards identified in cement plant. Silicosis, Bronchitis and Noise induced hearing loss are the diseases that could occur due to prolonged exposure / concentration found to be above the Permissible Exposure Level.

Workers involved in raw material handling section may get exposed to high dust levels. Over a long period of time such exposure is likely to result in respiratory problems / occupational health problems.

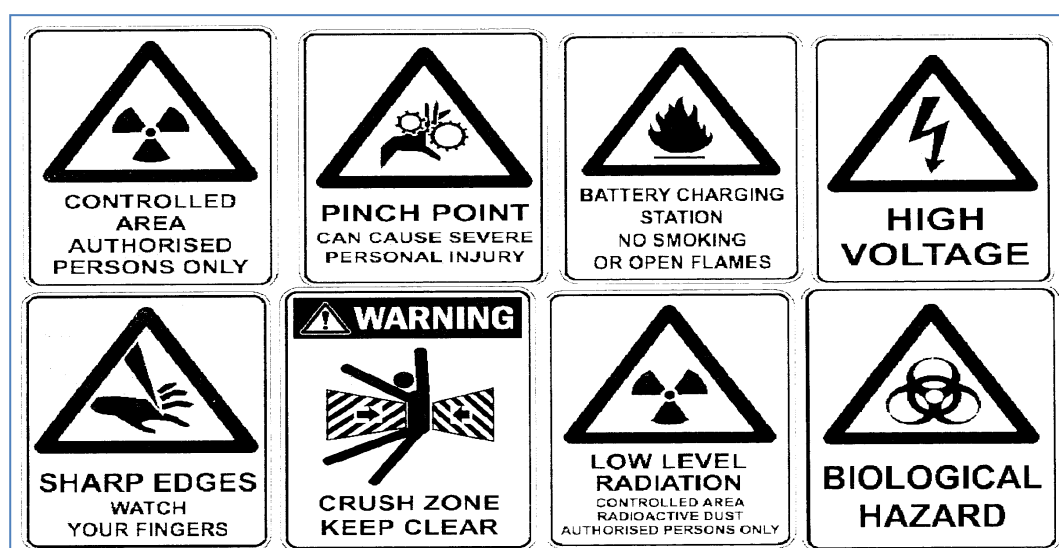
Preventive actions to keep hazards within permissible limit: Engineering measures shall be implemented to minimize the dust generation at the originating point by installing appropriate control devices. Plant personnel working in dust prone areas shall wear personal protective equipment like air filters over their nose. Job rotation schemes shall be practiced for over-exposed persons, particularly for heat stress. Proper illumination shall be maintained at each and every nook and corner of the workplaces.

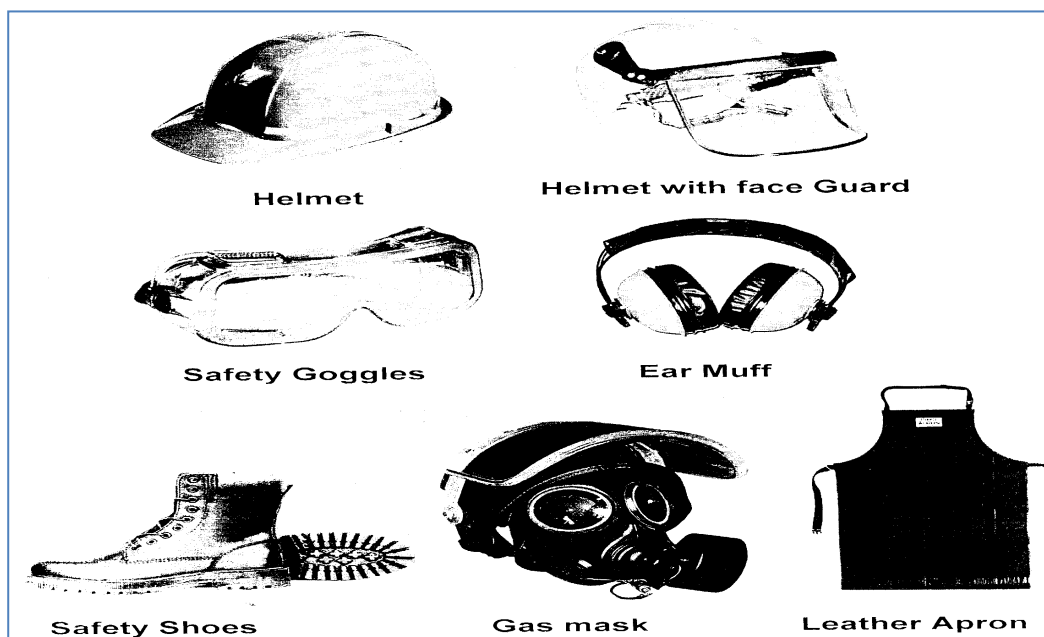
PPE like earplugs and muffs shall be provided to workers working near air compressors, and mills, and administrative pressure applied to the workers to use them. Workers exposed to mechanical accident-prone areas are given personal protective equipment (PPE) like tight rubber goggles, safety helmets, welders hand shields and

welding helmets, plastic face shields, ear plugs, earmuffs, rubber aprons, rubber gloves, shoes with non-skid soles, gum boots, safety shoe with toe protection.

Step taken to avoid muscular-skeleton disorders (MSD), backache, pain in joints, fatigue: Proper training provided to workers regarding correct work procedure and technique before allotting the job (like working in machines, lathes, lifting weight, working in height, etc). Regular advices are given to the workers through campaigns and illustrations related to safe work practices so that they do not develop any muscular strain or fatigue during their work schedules.

Creating Health Awareness: Safety data sheet of process materials shall be displayed at strategic locations like canteen, plant gate, administrative and accounts office (in Hindi and Bengali). Further the following signage has been displayed at mentioned locations.





Plan of exposure specific health status evolution of all exposed or supposed to be exposed workers: Prior to employment the workers are asked to submit a medical report, through the empanelled doctor of the company. The medical examination during pre-employment covers the following tests.

- General Physical Examination
- Blood Pressure
- ECG
- Sputum Test
- Routine Blood and Urine Test
- Eye Test

The medical report of the worker shall be maintained in a register. The health of workers shall be checked every year under an occupational surveillance programme

of the company. Under this program, the workers shall be subjected to medical examination by a qualified doctor / hospital empanelled by the company.

Plan of pre-placement and periodical medical examination: In future the workers shall be investigated by pre-designed format for following parameters during pre-placement and thereafter every five years:

	Name of Disease	Recommended Tests
1.	Heart Disease	ECG, blood for lipid profile, stress test, 2D-Echo
2.	Lung Diseases	Total Count (WBC Count), Differential Count, Sputum examination, X-ray Chest, Alveolar macrophage
3.	Respiratory Disorders	Differential Count, ESR, X-ray chest, Lung Function Tests (Spirometry) and Sputum examination
4.	Diabetes	Random blood sugar, urine sugar, if positive, BSL-Fasting / pp, Diabetic profile, Renal profile
5.	Hypertension	Blood Pressure reading, ECG and stress test
6.	Abdomen Pain	Routine Urine for Albumin, Sugar bile salts, Liver function test
7.	Eye Problems	Routine Eye Test, Fundus examination, retinopathy test, colour blindness, Vision testing (Colour vision, far and near vision and for other ocular defect)
8.	Ear Problems	Audiometry - auditory threshold for pure tones

Spirometry Test: Pulmonary function tests are a group of tests that measure how well the lungs take in and release air and how well they move gases such as oxygen from the atmosphere into the body's circulation. Spirometry (meaning the measuring of breath) is the most common of the Pulmonary Function Tests (PFTs), measuring lung function, specifically the measurement of the amount (volume) and/or speed (flow) of air that can be inhaled and exhaled. Spirometry is an important tool used for generating pneumotachographs which are helpful in assessing conditions such as asthma, pulmonary fibrosis, cystic fibrosis, and chronic obstructive pulmonary disease (COPD).

Pulmonary function tests on workers shall be done in order to:

- Diagnose certain types of lung disease (especially asthma, bronchitis, and emphysema)
- Find the cause of shortness of breath
- Measure whether exposure to contaminants at work affects lung function

Electrocardiogram (ECG) Test: The electrocardiogram (ECG) is a diagnostic tool that measures and records the electrical activity of the heart in exquisite detail. Interpretation of ECG details allows diagnosis of a wide range of heart conditions. These conditions can vary from minor to life threatening. The annual analysis helps in keeping track of heart related illness caused due to several occupational reasons.

Bradycardia (Greek bradykardía, "heart slowness"), is the resting heart rate of under 60 beats per minute, though it is seldom symptomatic until the rate drops below 50 beat/min. It may cause cardiac arrest in some patients, because those with bradycardia may not be pumping enough oxygen to their heart. It sometimes results in fainting, shortness of breath, and if severe enough, death. Tachycardia comes from the Greek words tachys (rapid or accelerated) and kardia (of the heart). Tachycardia typically refers to a heart rate that exceeds the normal range for a resting heart rate (heart rate in an inactive or sleeping individual). It can be dangerous depending on the speed and type of rhythm.

Myocardial infarction (MI) or acute myocardial infarction (AMI), commonly known as a heart attack, is the interruption of blood supply to a part of the heart, causing heart cells to die. Classical symptoms of acute myocardial infarction include sudden chest pain (typically radiating to the left arm or left side of the neck), shortness of breath, nausea, vomiting, palpitations, sweating, and anxiety (often described as a sense of impending doom).

Audiometry Test: Audiometry is the testing of hearing ability, involving thresholds and differing frequencies. Typically, audiometric tests determine a subject's hearing levels with the help of an audiometer but may also measure ability to discriminate between different sound intensities, recognize pitch, or distinguished speech from background noise. Acoustic reflex and otoacoustic emissions may also be measured. Results of audiometric tests are used to diagnose hearing loss or diseases of the ear, and often make use of an Audiogram.

Noise-induced hearing loss (NIHL) is an increasingly prevalent disorder that results from exposure to high-intensity sound, especially over a long period of time. The ear can be exposed to short periods in excess of 120 dB without permanent harm — albeit with discomfort and possibly pain, but long term exposure to sound levels over 80 dB can cause permanent hearing loss.

There are two basic types of NIHL; NIHL caused by acoustic trauma and gradually developing NIHL.

Acoustic Trauma: NIHL caused by acoustic trauma refers to permanent cochlear damage from a one-time exposure to excessive sound pressure. This form of NIHL commonly results from exposure to high intensity sounds such as explosions, gunfire, a large drum hit loudly and firecrackers.

Gradually developing NIHL: Gradually developing NIHL refers to permanent cochlear damage from repeated exposure to loud sounds over a period of time. Unlike NIHL from acoustic trauma, this form of NIHL does not occur from a single exposure to a high-intensity sound pressure level.

Vision Test: An eye examination is a battery of tests performed by an ophthalmologist and optometrist assessing vision and ability to focus on and discern objects, as well as other tests and examinations pertaining to the eyes. Health care professionals often recommend that all people should have periodic and thorough eye examinations as part of routine primary care, especially since many eye diseases are asymptomatic. Eye examinations may detect potentially treatable blinding eye diseases, ocular manifestations of systemic disease, or signs of tumours or other anomalies of the brain.

Refractive error or refraction error, is an error in the focusing of light by the eye and a frequent reason for reduced visual acuity.

Colour blindness or colour vision deficiency is the inability or decreased ability to see colour, or perceive color differences, under lighting conditions when colour vision is not normally impaired. "Color blind" is a term which indicate a fault in the development of either or both sets of retinal cones that perceive colour in light and transmit that information to the optic nerve.

Health Record and Analysis: The health records of workers starting from employment date till their retirement shall be maintained. These medical records shall be statistically analysed every year to know the trend of employee health. The data shall be analysed as per age, sex, duration of exposure and department wise. In case some serious trend is noted then suitable preventive action shall be taken to address the health issues. Annual Report of health status of workers shall be published. While leaving / resigning from employment the health record of the worker shall be handed over to him.

Infrastructure Facilities for Labour & Drivers: Infrastructure facilities such as sanitation, fuel, restroom etc. to be provided to the labour force including drivers and visitors during construction period as well as operation period. These facilities to be provided to the casual workers including truck drivers during operation phase.

9.14. Rain Water harvesting plan

Rain water harvesting artificial recharge to ground water is feasible in the area. Types of recharge structure suitable in the area are as follows: trenches and injection wells. Injection wells of 100 to 120 m depth can be constructed depending upon the local hydro geological conditions.

In order to compensate ground water withdrawal the aquifer will be recharged through rainwater harvesting in the plant area. The dimensions of the pits shall be based on CGWB guidelines (the rainfall collection volume from a defined area multiplied by runoff coefficient). The pits will be partially filled by sand and boulders. Depending upon the area adequately sized pits will be constructed. The total area available for rainwater harvesting in Packing plan and truck loading area is estimated to be 8688 m². The annual potential is as under:

Catchment area (Total Roof Top Area) (A) = 8688 m²

Average annual Rainfall (R) = 1836 mm or 1.83 m

Run of Coefficient (C) = 0.8

Annual Potential = A x R x C

Total = 12719 m³

The trenches of 3 m depth be constructed and filled with inverted filter material up to 2 m of depth, remaining one m of depth will be kept as free board which acts as storage of storm water. The trench serves dual purpose of storing the excess water and filtering the suspended particles/silt.

For construction of recharge well bore hole of 450 mm (18") dia is to be got drilled with Reverse Rotary Method of drilling. In case sufficient space is not available in the areas close to building, the drilling may be taken up with hand boring and dia of bore hole should be 10". Recharge well assembly of 6" dia should be lowered into the borehole. The annular space between the assembly and boreholes is to be filled with gravel of 3 to 5 mm size. The aquifer zone to be recharge should be screened by PVC/M.S slotted pipes. Within the trench to PVC/M.S slotted pipes having 3 mm slot size are to be fixed on either side of the 6 " dia pipe for filtered water to enter into the recharge well. Only aquifer encountered at the bottom of borehole should be screened. After construction trench cum recharge well, the channelized water is to be connected with the recharge structures through R.C.C. of M.S. pipes.

9.15. Compliance with CREP Recommendations

1. Cement plants, which were not complying with notified standards, had to do the following to meet the standards:
 - Augmentation of existing Air Pollution Control Devices – by July 2003
 - Replacement of existing Air Pollution Control Devices – by July 2004

Compliance: The air pollution control devices shall be designed to meet the PM emission of 30 mg/Nm³.

2. Cement plants located in critically polluted of urban areas (including 5 km distance outside urban boundary) will have to meet 100 mg/Nm³ limit of particulate matter by December 2004 and continue working to reduce the emission of particulate matter to 30 mg/Nm³.

Compliance: The air pollution control devices shall be designed to meet the PM emission of -30mg/Nm³.

3. The new cement kilns to be accorded NOC / Environmental Clearance w.e.f. 01.04.2003 will meet the limit of 50 mg/Nm³ for particulate matter emissions.

Compliance: The air pollution control devices shall be designed to meet the PM emission of 30mg/Nm³.

4. CPCB evolved load-based standards by December 2003.

Compliance: The plant is achieving load-based standards evolved by CPCB

5. CPCB and NCBM evolved SO₂ and NO_x emission standards by June 2004.

Compliance: Emission standards for SO₂ and NO_x not notified

6. The cement industries have to control fugitive emissions from all the raw material and products storage and transfer points by December 2003.

Compliance: Fugitive emissions from all the raw materials and product storage and transfer points, as per NTF recommendations, considered in the project.

7. CPCB, NCBM, BIS and Oil refineries have jointly prepared the policy on use of petroleum coke as fuel in cement kiln in July 2003.

Compliance: Not applicable for this project.

8. After performance evaluation of various types of continuous monitoring equipment and feedback from the industries and equipment manufacturers, NTF will decide feasible unit operations/sections for installation of continuous monitoring equipment. The industry will have to install the continuous monitoring systems (CMS) by December 2003.

Compliance: Continuous emission monitoring system considered for all major stacks.

9. Tripping in kiln ESP to be minimized by July 2003 as per the recommendation of NTF.

Compliance: ESP not considered. High efficiency Bag House considered for control of air emissions from cement mill (VRM).

10. Industries had to submit the target date to enhance the utilization of waste material by April 2003.

Compliance: Not applicable because it is a cement grinding unit.

11. NCBM carried out a study on hazardous waste utilization in cement kiln in December 2003.

Compliance: Not applicable because it is a cement grinding unit.

12. Cement industries have to carry out feasibility study and submit target dates to CPCB for co-generation of power by July 2003.

Compliance: Not applicable because it is a cement grinding unit.

9.16. Budget for Pollution Control and Environmental Management

The capital cost for environmental management of the proposed project is estimated to be **Rs.10.00 crores**. Budget allocation of **Rs 50 Lakh** shall be made every year to meet the recurring expenditure for implementing the environmental control and improvement measures. The break-up of the investment is shown in **Table 9.6**.

Table 9.6 : Investment on Environmental Protection Measures

SL No	ITEM DESCRIPTION	For Proposed Expansion	
		CAPITAL INVESTMENT (Rs. in Lakhs)	RECURRING COST PER YEAR (Rs. in Lakhs)
1.	Air Pollution Control (Bag House/ filters, dust suppression hoods etc)	800	15
2.	Water Pollution Control/Sewage Treatment Plant	30	05
3.	Noise Pollution Control	15	02
4.	Solid Waste Management	30	05
5.	Environment Monitoring and Management	50	10
6.	RWH	30	05
7.	Green Belt & Landscaping, Others	45	8
	Total	1000	50

CHAPTER 10. SUMMERY & CONCLUSION

M/s. Ambuja Cements Limited (ACL) has an existing stand-alone Cement Grinding Unit of 2.4 MTPA capacity at Village - Jala Dhulagori, Tehsil - Sankrail, District - Howrah (West Bengal). Ambuja Cement Plant Sankrail is started in 1991 with an entire annual capacity of one million tonnes of cement. Ambuja Cement Limited (ACL) is the franchisee of the cement plant and the type of franchisee is Private. Ambuja Cement Plant of Sankrail is one among the top cement manufacturer of India.

M/s. Ambuja Cements Limited (Unit: Sankrail) is now proposing Expansion in Cement Production Capacity from 2.4 MTPA to 4.0 MTPA of Existing Stand-alone Grinding Unit at Village: Jala Dhulagori, Tehsil: Sankrail, District: Howrah (West Bengal).

As per the Environmental Impact Assessment Notification, 2006 and amendments thereof, proposed Expansion project (Cement Grinding Unit) falls under category "B" and Section 3(b) of its schedule. But the site is located proximity to Critically polluted area of Jalon Industrial Complex-I (Howrah) hence to be appraised as category A.

The terms of Reference (ToR) for EIA study of proposed expansion were accorded by MOEF&CC vide letter no. No.J-11011/547/2010-IA.II(I) dated 15thFeb 2022. The Draft EIA report has been prepared as per the ToR issued by MOEF&CC.

Proposed expansion will be done within the existing plant area. No additional land will be acquired for the proposed expansion. Total area available with the ACL at Sankrail unit is 32.64 ha. Out of the total area existing plant is located in 18.36 ha. Rest of the 14.28 ha has been proposed for said expansion.

Proposed plant site is located at Village: Jala Dhulagori, Tehsil: Sankrail, District: Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail). The site is well connected to NH - 6 (~0.2 km in NW direction) and NH - 117 (~7.5 km in ENE direction). Nearest town is Andul (~5.5 km in ENE direction). Nearest Railway Station is Sankrail Railway Station (~1.5 km in ESE direction). Nearest Airport from plant site is Kolkata Airport (~26.5 km in NE direction). Hoogly River is nearest river flowing at 4.0 km (ESE) from the ACL project site. Project site lies under seismic zone III, with moderate risk. Jalan Industrial Complex is located about 3.07 km from the plant boundary, which is critically polluted area near the project site.

No presence of wildlife, reserved forests/Protected Forest/ wetlands/ mangroves/ are found within 10 km radius of the project site.

The estimated cost of the expansion project is Rs. 400 crores. The expansion project will create the employment for 1000 people during construction phase and 140 during operation phase. The water consumption for grinding unit will be low as the requirements are only for cooling system and the water will be re-circulated in a closed system. Only make up for water will be required for meeting the evaporation losses in the cooling circuit. The source of water would be from the ground water. Water for drinking and domestic purposes will be needed additionally. Fresh Water requirement

for existing grinding unit is about 180 KLD. For proposed expansion about 90 KLD fresh water and 40 KLD recycled water shall be required. After expansion total freshwater requirement will be 270 KLD. Water requirement of existing as well as proposed expansion unit shall be sourced from ground water. ACL has already obtained Permission for ground water withdrawal (270 KLD) from West Bengal Ground Water Resources for the existing as well as proposed expansion unit.

The baseline study and primary data collection has been carried out during 1st March 2022 to 31st May 2022. 10 km area around the existing plant boundary was considered as study area. Data was generated by following the standard procedures of the Ministry of Environment & Forests and the Central Pollution Control Board. Meteorological data on wind speed, wind direction, relative humidity and temperature was generated at site. Baseline ambient air quality was measured at 8 locations within the core and buffer zone. Noise levels were measured at 8 locations. Surface water quality of 3 locations, groundwater quality of 8 locations and soil quality of 6 locations was collected and analyzed. Data on plants and animals present in the core and buffer zone was collected from the published literatures and checked during field survey. Data on demography, occupation pattern, cropping pattern, infrastructure facilities were collected from District Statistics Handbook and Primary Census of India 2011. Land use, drainage and contours were estimated using the recent satellite imagery. The study area falls under Seismic Zone III.

EMP for effective management of environmental impacts due to the proposed expansion project and ensuring overall protection of the surrounding environment through appropriate management procedures has been prepared.

The capital cost for environmental management of the proposed project is estimated to be **Rs 10 Cr**. This amount shall be used for procurement of pollution control during construction phase, Occupational Health & Safety of workers during construction phase, Water Supply & Drainage system, Storm water management, Solar streetlight within project area, wastewater management, environmental monitoring, CSR/CER and greenbelt development. About **Rs 0.50 Cr** would be required as annual recurring expenses to implement the EMP.

ACL has spent Rs 263.39 lakh in year 2019-2020, Rs. 157.55 Lakhs in year 2020-2021 and Rs. 152.335 lakhs in year 2021-2022 in community development under CSR activities. For proposed expansion ACL has earmarked a budget of Rs. 300 Lakhs for undertaking CSR activities based on need-based analysis. This budget is for upcoming 3 years. This money will be spent for different CSR activities like agro based livelihood, women empowerment, health, and community welfare in surrounding villages.

EMC will ensure that all air pollution control devices, wastewater treatment and water re-circulating systems function effectively. Contractor under the supervision of the company will do implementation of pollution control measures during construction


phase. EMC will also ensure cleanliness and industrial hygiene in the plant. All records shall be submitted to the regulatory authorities (State Pollution Control Board), displayed at company gate and website.

CHAPTER 11. DISCLOSURE OF CONSULTANTS



Declaration by Experts Contributing to the EIA/EMP REPORT for Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail, District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail).

I, hereby, certify that I was a part of the EIA team in the following capacity that developed the above EIA report.





EIA COORDINATOR

Signature	
Name	Ratnesh Kotiyal
Period of involvement	December, 2021 to Finalization of report
Contact Information:	9718472464

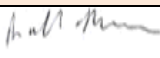



FUNCTIONAL AREA EXPERTS

Functional Areas	Name of the Expert	Team Member	Involvement (Period and Task**) December 2021 to finalization of report	Signature
Air Pollution Monitoring & Control (AP)	Mr.S.K. Jain	-	<ul style="list-style-type: none"> Air pollution monitoring. Meteorological parameter measurement. Identification & assessment of quantum of emission and its Mitigation measures. 	
Air Quality Modeling and Prediction (AQ)	Mrs. Sweta Kaushik Shah	Mr. Kapil Singh	<ul style="list-style-type: none"> Ambient Air Quality monitoring network designing. Processing of micrometeorological data for using in model. Air quality modelling through ISC- Aermid for proposed prediction of impact 	
Noise and Vibration (NV)	Ms. Sweta Kaushik Shah	Mr. Kapil Singh	<ul style="list-style-type: none"> Monitoring of noise levels of the project site 	

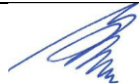

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

Functional Areas	Name of the Expert	Team Member	Involvement (Period and Task**) December 2021 to finalization of report	Signature
			<ul style="list-style-type: none"> and surrounding area. Assessment of noise level and vibration potential due to proposed project and its mitigation measures. 	
Water Pollution (WP)	Mr.S.K. Jain		<ul style="list-style-type: none"> Water Quality monitoring network designing. Sampling of water samples (surface and ground water). Water Balance Identification & assessment of quantum of water pollution and its Mitigation measures. ETP Suggestion. 	
Ecology and Bio-diversity Conservation (EB)	Mr. Ratnesh Kotiyal	Ms. Khushboo Thakur	<ul style="list-style-type: none"> Conducted Ecological survey & preparation of status report. Application of taxonomy in resource inventory (Flora & Fauna) List of species animals and plants report. Identification & assessment of ecological impact due to proposed project and its Mitigation measures. 	
Solid and Hazardous Waste Management (SHW)	Mr.SK Jain		<ul style="list-style-type: none"> Identification of hazardous and non-hazardous wastes. Reuse and recycling of solid wastes. Handling and disposal of non-Hazardous solid waste & Hazardous waste. 	
Risk and Hazards (RH)	Mr. P.K. Srivastava	Ms. Kirti Patni	<ul style="list-style-type: none"> Identification of hazards due to 	

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

Functional Areas	Name of the Expert	Team Member	Involvement (Period and Task**) December 2021 to finalization of report	Signature
			<ul style="list-style-type: none"> proposed project. Identification of hazardous substances in the proposed project. Preparation of risk assessment report and onsite emergency plan. 	
Land Use (LU)	Mr. Anil Kumar	Mr. Kaleem Ahmad	<ul style="list-style-type: none"> Development of landuse maps of study area using GIS / related tools, site visit for ground truth survey, finalization of landuse maps 	
Socioeconomics (SE)	Mr. Anil Kumar	-	<ul style="list-style-type: none"> Site visit, Socio Economic secondary study Primary study and consultation in study area for assessment of need and socio-economic survey data validation. Preparation of CSR/CER plan and its budgeting. 	
Geology	Nisha Rani	-	<ul style="list-style-type: none"> Conducted study of geology of the project site and study area. Identification of geological formations at the project site as well as in the study area. Study about topography of the project site and study area, contours of the area, physiography, slope of the area, drainage of the area and geology of the study area. Study about geology of 	


**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

Functional Areas	Name of the Expert	Team Member	Involvement (Period and Task**) December 2021 to finalization of report	Signature
			the project site, subsurface conditions of the project site. • Recommendations and preparation of reports on geology.	
Hydrogeology	Mr. Yamesh Sharma	-	<ul style="list-style-type: none"> • Estimation of run-off generation from site & post project development • Formulation of rainwater harvesting plan • Formulation of water conservation plan 	
Soil Conservation	Ratnesh Kotiyal	-	<ul style="list-style-type: none"> • Formulation of soil monitoring plan • Soil sample collection and testing • Impact assessment of project on soil quality and development of management plan 	

DECLARATION BY THE HEAD OF THE ACCREDITED CONSULTANT ORGANIZATION

I, S.K.Jain, hereby confirm that the above-mentioned experts prepared the EIA/EMP REPORT for Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail, District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail). I also confirm that EIA Co-ordinator has gone through the report, and the consultant organization shall be fully accountable for any mis-leading information mentioned in this statement.

It is certified that no unethical practices including plagiarism have been carried out and external data/ text has not been used without proper acknowledgement, while preparing this EIA report.

Signature:	
Name:	Mr. S.K. Jain
Designation:	Director, Technical
Name of the EIA Consultant	EQMS India Pvt. Ltd.

organization	
NABET Certificate No. and date	NABET/EIA/1922/RA0197 dated 15.03.2021 valid till 23.11.2022




Quality Council of India

National Accreditation Board for Education & Training

CERTIFICATE OF ACCREDITATION

EQMS India Pvt Ltd.

305, 3rd Floor, Plot No. 16, Rishabh Towers, Community Centre, Karkardooma, Delhi – 110 092

The organization is accredited as Category-A under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3: for preparing EIA-EMP reports in the following Sectors –

Sl. No.	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1.	Mining of minerals- opencast only	1	1 (a) (i)	A
2.	Offshore and onshore oil and gas exploration, development & production	2	1 (b)	A
3.	River valley projects	3	1 (c)	A
4.	Thermal power plants	4	1 (d)	A
5.	Cement plants	9	3 (b)	B
6.	Chemical fertilizers	16	5 (a)	A
7.	Pesticides industry and pesticide specific intermediates	17	5 (b)	A
8.	Synthetic organic chemicals industry	21	5 (f)	A
9.	Pulp & paper industry excluding manufacturing of paper from wastepaper and manufacture of paper from ready pulp without bleaching	24	5 (i)	A
10.	Isolated storage & handling of Hazardous chemicals	28	-	B
11.	Airports	29	7 (a)	A
12.	Industrial estates/ parks/ complexes/areas, export processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes	31	7 (c)	A
13.	Bio-medical waste treatment facilities	32A	7 (d a)	A
14.	Ports, harbours, break waters and dredging	33	7 (e)	A
15.	Highways	34	7 (f)	A
16.	Common Municipal Solid Waste Management Facility	37	7 (i)	B
17.	Building and construction projects	38	8 (a)	B
18.	Townships and Area development projects	39	8 (b)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated Jan 22, 2021 posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/21/1661 dated March 15, 2021. The accreditation needs to be renewed before the expiry EQMS India Pvt Ltd, New Delhi following due process of assessment.



Sr. Director, NABET
Dated: March 15, 2021

Certificate No.
NABET/EIA/1922/RA 0197

Valid till
Nov 23, 2022

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website

APPENDIX-1 TOR LETTER ISSUED BY MOEF&CC

**Environmental Impact Assessment Report for
Expansion of Existing cement Grinding Unit at Village- JalaDhulagori, Tehsil-Sankrail,
District-Howrah (West Bengal) by M/s. Ambuja Cements Limited (Unit: Sankrail)**

No.J-11011/547/2010-IA.II(I)

Government of India
Minister of Environment, Forest and Climate Change
Impact Assessment Division

Indira Paryavaran Bhavan,
Vayu Wing, 3rd Floor, Aliganj,
Jor Bagh Road, New Delhi-110003
15 Feb 2022

To,

M/s AMBUJA CEMENT LIMITED
228, Udyog Vihar, Phase-I,,
Gurgaon-122016
Haryana

Tel.No.124-4565328; Email:sanjeewkumar.singh@ambujacement.com

Sir/Madam,

This has reference to the proposal submitted in the Ministry of Environment, Forest and Climate Change to prescribe the Terms of Reference (TOR) for undertaking detailed EIA study for the purpose of obtaining Environmental Clearance in accordance with the provisions of the EIA Notification, 2006. For this purpose, the proponent had submitted online information in the prescribed format (Form-1) along with a Pre-feasibility Report. The details of the proposal are given below:

- | | |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Proposal No.: | IA/WB/IND/248462/2021 |
| 2. Name of the Proposal: | Expansion of Existing Cement Grinding Unit
from 2.4 to 4.0 MTPA at Village : JalaDhulagori,
Tehsil:Sankrail, District:Howrah (West Bengal)
by M/s. Ambuja Cements Limited (Unit:
Sankrail) |
| 3. Category of the Proposal: | Industrial Projects - 1 |
| 4. Project/Activity applied for: | 3(b) Cement plants |
| 5. Date of submission for TOR: | 14 Feb 2022 |

In this regard, under the provisions of the EIA Notification 2006 as amended, the Standard TOR for the purpose of preparing environment impact assessment report and environment management plan for obtaining prior environment clearance is prescribed with public consultation as follows:

**STANDARD TERMS OF REFERENCE (TOR) FOR EIA/EMP REPORT FOR
PROJECTS/ACTIVITIES REQUIRING ENVIRONMENT CLEARANCE**

**3(b):STANDARD TERMS OF REFERENCE FOR CONDUCTING
ENVIRONMENT IMPACT ASSESSMENT STUDY FOR CEMENT
PLANTS PROJECTS AND INFORMATION TO BE INCLUDED IN EIA/
EMP REPORT**

A. STANDARD TERMS OF REFERENCE (TOR)

1) Executive Summary

2) Introduction

- i. Details of the EIA Consultant including NABET accreditation
- ii. Information about the project proponent
- iii. Importance and benefits of the project

3) Project Description

- i. Cost of project and time of completion.
- ii. Products with capacities for the proposed project.
- iii. If expansion project, details of existing products with capacities and whether adequate land is available for expansion, reference of earlier EC if any.
- iv. List of raw materials required and their source along with mode of transportation.
- v. Other chemicals and materials required with quantities and storage capacities
- vi. Details of Emission, effluents, hazardous waste generation and their management.
- vii. Requirement of water, power, with source of supply, status of approval, water balance diagram, man-power requirement (regular and contract)
- viii. Process description along with major equipments and machineries, process flow sheet (quantative) from raw material to products to be provided
- ix. Hazard identification and details of proposed safety systems.
- x. Expansion/modernization proposals:
 - a. Copy of all the Environmental Clearance(s) including Amendments thereto obtained for the project from MOEF/SEIAA shall be attached as an Annexure. A certified copy of the latest Monitoring Report of the Regional Office of the Ministry of Environment and Forests as per circular dated 30th May, 2012 on the status of compliance of conditions stipulated in all the existing environmental clearances including Amendments shall be provided. In addition, status of compliance of Consent to Operate for the ongoing Iexisting operation of the project from SPCB shall be attached with the EIA-EMP report.
 - b. In case the existing project has not obtained environmental clearance, reasons for not taking EC under the provisions of the EIA Notification 1994 and/or EIA Notification

STANDARD TERMS OF REFERENCE (TOR) FOR EIA/EMP REPORT FOR PROJECTS/ ACTIVITIES REQUIRING ENVIRONMENT CLEARANCE

2006 shall be provided. Copies of Consent to Establish/No Objection Certificate and Consent to Operate (in case of units operating prior to EIA Notification 2006, CTE and CTO of FY 2005-2006) obtained from the SPCB shall be submitted. Further, compliance report to the conditions of consents from the SPCB shall be submitted.

4) Site Details

- i. Location of the project site covering village, Taluka/Tehsil, District and State, Justification for selecting the site, whether other sites were considered.
- ii. A toposheet of the study area of radius of 10km and site location on 1:50,000/1:25,000 scale on an A3/A2 sheet. (including all eco-sensitive areas and environmentally sensitive places)
- iii. Details w.r.t. option analysis for selection of site
- iv. Co-ordinates (lat-long) of all four corners of the site.
- v. Google map-Earth downloaded of the project site.
- vi. Layout maps indicating existing unit as well as proposed unit indicating storage area, plant area, greenbelt area, utilities etc. If located within an Industrial area/Estate/Complex, layout of Industrial Area indicating location of unit within the Industrial area/Estate.
- vii. Photographs of the proposed and existing (if applicable) plant site. If existing, show photographs of plantation/greenbelt, in particular.
- viii. Landuse break-up of total land of the project site (identified and acquired), government/private - agricultural, forest, wasteland, water bodies, settlements, etc shall be included. (not required for industrial area)
- ix. A list of major industries with name and type within study area (10km radius) shall be incorporated. Land use details of the study area
- x. Geological features and Geo-hydrological status of the study area shall be included.
- xi. Details of Drainage of the project upto 5km radius of study area. If the site is within 1 km radius of any major river, peak and lean season river discharge as well as flood occurrence frequency based on peak rainfall data of the past 30 years. Details of Flood Level of the project site and maximum Flood Level of the river shall also be provided. (mega green field projects)
- xii. Status of acquisition of land. If acquisition is not complete, stage of the acquisition process and expected time of complete possession of the land.
- xiii. R&R details in respect of land in line with state Government policy

5) Forest and wildlife related issues (if applicable):

- i. Permission and approval for the use of forest land (forestry clearance), if any, and recommendations of the State Forest Department. (if applicable)
- ii. Landuse map based on High resolution satellite imagery (GPS) of the proposed site delineating the forestland (in case of projects involving forest land more than 40 ha)

**STANDARD TERMS OF REFERENCE (TOR) FOR EIA/EMP REPORT FOR
PROJECTS/ACTIVITIES REQUIRING ENVIRONMENT CLEARANCE**

- iii. Status of Application submitted for obtaining the stage I forestry clearance along with latest status shall be submitted.
- iv. The projects to be located within 10 km of the National Parks, Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild Animals, the project proponent shall submit the map duly authenticated by Chief Wildlife Warden showing these features vis-à-vis the project location and the recommendations or comments of the Chief Wildlife Warden-thereon.
- v. Wildlife Conservation Plan duly authenticated by the Chief Wildlife Warden of the State Government for conservation of Schedule I fauna, if any exists in the study area
- vi. Copy of application submitted for clearance under the Wildlife (Protection) Act, 1972, to the Standing Committee of the National Board for Wildlife

6) Environmental Status

- i. Determination of atmospheric inversion level at the project site and site-specific micro-meteorological data using temperature, relative humidity, hourly wind speed and direction and rainfall.
- ii. AAQ data (except monsoon) at 8 locations for PM10, PM2.5, SO₂, NO_x, CO and other parameters relevant to the project shall be collected. The monitoring stations shall be based CPCB guidelines and take into account the pre-dominant wind direction, population zone and sensitive receptors including reserved forests.
- iii. Raw data of all AAQ measurement for 12 weeks of all stations as per frequency given in the NAQPM Notification of Nov. 2009 along with - min., max., average and 98% values for each of the AAQ parameters from data of all AAQ stations should be provided as an annexure to the EIA Report.
- iv. Surface water quality of nearby River (100m upstream and downstream of discharge point) and other surface drains at eight locations as per CPCB/MoEF&CC guidelines.
- v. Whether the site falls near to polluted stretch of river identified by the CPCB/MoEF&CC, if yes give details.
- vi. Ground water monitoring at minimum at 8 locations shall be included.
- vii. Noise levels monitoring at 8 locations within the study area.
- viii. Soil Characteristic as per CPCB guidelines.
- ix. Traffic study of the area, type of vehicles, frequency of vehicles for transportation of materials, additional traffic due to proposed project, parking arrangement etc.
- x. Detailed description of flora and fauna (terrestrial and aquatic) existing in the study area shall be given with special reference to rare, endemic and endangered species. If Schedule-I fauna are found within the study area, a Wildlife Conservation Plan shall be prepared and furnished.
- xi. Socio-economic status of the study area.

STANDARD TERMS OF REFERENCE (TOR) FOR EIA/EMP REPORT FOR PROJECTS/ ACTIVITIES REQUIRING ENVIRONMENT CLEARANCE

7) Impact and Environment Management Plan

- i. Assessment of ground level concentration of pollutants from the stack emission based on site-specific meteorological features. In case the project is located on a hilly terrain, the AQIP Modelling shall be done using inputs of the specific terrain characteristics for determining the potential impacts of the project on the AAQ. Cumulative impact of all sources of emissions (including transportation) on the AAQ of the area shall be assessed. Details of the model used and the input data used for modelling shall also be provided. The air quality contours shall be plotted on a location map showing the location of project site, habitation nearby, sensitive receptors, if any.
- ii. Water Quality modelling - in case of discharge in water body
- iii. Impact of the transport of the raw materials and end products on the surrounding environment shall be assessed and provided. In this regard, options for transport of raw materials and finished products and wastes (large quantities) by rail or rail-cum road transport or conveyor-cum-rail transport shall be examined.
- iv. A note on treatment of wastewater from different plant operations, extent recycled and reused for different purposes shall be included. Complete scheme of effluent treatment. Characteristics of untreated and treated effluent to meet the prescribed standards of discharge under E(P) Rules.
- v. Details of stack emission and action plan for control of emissions to meet standards.
- vi. Measures for fugitive emission control
- vii. Details of hazardous waste generation and their storage, utilization and management. Copies of MOU regarding utilization of solid and hazardous waste in cement plant shall also be included. EMP shall include the concept of waste-minimization, recycle/reuse/recover techniques, Energy conservation, and natural resource conservation.
- viii. Proper utilization of fly ash shall be ensured as per Fly Ash Notification, 2009. A detailed plan of action shall be provided.
- ix. Action plan for the green belt development plan in 33 % area i.e. land with not less than 1,500 trees per ha. Giving details of species, width of plantation, planning schedule etc. shall be included. The green belt shall be around the project boundary and a scheme for greening of the roads used for the project shall also be incorporated.
- x. Action plan for rainwater harvesting measures at plant site shall be submitted to harvest rainwater from the roof tops and storm water drains to recharge the ground water and also to use for the various activities at the project site to conserve fresh water and reduce the water requirement from other sources.
- xi. Total capital cost and recurring cost/annum for environmental pollution control measures shall be included.
- xii. Action plan for post-project environmental monitoring shall be submitted.

**STANDARD TERMS OF REFERENCE (TOR) FOR EIA/EMP REPORT FOR
PROJECTS/ACTIVITIES REQUIRING ENVIRONMENT CLEARANCE**

- xiii. Onsite and Offsite Disaster (natural and Man-made) Preparedness and Emergency Management Plan including Risk Assessment and damage control. Disaster management plan should be linked with District Disaster Management Plan.

8) Occupational health

- i. Plan and fund allocation to ensure the occupational health & safety of all contract and casual workers
- ii. Details of exposure specific health status evaluation of worker. If the workers' health is being evaluated by pre designed format, chest x rays, Audiometry, Spirometry, Vision testing (Far & Near vision, colour vision and any other ocular defect) ECG, during pre placement and periodical examinations give the details of the same. Details regarding last month analyzed data of above mentioned parameters as per age, sex, duration of exposure and department wise.
- iii. Details of existing Occupational & Safety Hazards. What are the exposure levels of hazards and whether they are within Permissible Exposure level (PEL). If these are not within PEL, what measures the company has adopted to keep them within PEL so that health of the workers can be preserved,
- iv. Annual report of health status of workers with special reference to Occupational Health and Safety.

9) Corporate Environment Policy

- i. Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report.
- ii. Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions? If so, it may be detailed in the EIA.
- iii. What is the hierarchical system or Administrative order of the company to deal with the environmental issues and for ensuring compliance with the environmental clearance conditions? Details of this system may be given.
- iv. Does the company have system of reporting of non compliances / violations of environmental norms to the Board of Directors of the company and / or shareholders or stakeholders at large? This reporting mechanism shall be detailed in the EIA report

- 10)** Details regarding infrastructure facilities such as sanitation, fuel, restroom etc. to be provided to the labour force during construction as well as to the casual workers including truck drivers during operation phase.

11) Enterprise Social Commitment (ESC)

- i. Adequate funds (at least 2.5 % of the project cost) shall be earmarked towards the Enterprise Social Commitment based on Public Hearing issues and item-wise details along with time

STANDARD TERMS OF REFERENCE (TOR) FOR EIA/EMP REPORT FOR PROJECTS/ ACTIVITIES REQUIRING ENVIRONMENT CLEARANCE

bound action plan shall be included. Socio-economic development activities need to be elaborated upon.

- 12) Any litigation pending against the project and/or any direction/order passed by any Court of Law against the project, if so, details thereof shall also be included. Has the unit received any notice under the Section 5 of Environment (Protection) Act, 1986 or relevant Sections of Air and Water Acts? If so, details thereof and compliance/ATR to the notice(s) and present status of the case.
- 13) A tabular chart with index for point wise compliance of above TOR.

B. SPECIFIC TERMS OF REFERENCE FOR EIA STUDIES FOR CEMENT PLANTS

1. Limestone and coal linkage documents along with the status of environmental clearance of limestone and coal mines
2. Quantum of production of coal and limestone from coal & limestone mines and the projects they cater to;
3. For large Cement Units, a 3-D view i.e. DEM (Digital Elevation Model) for the area in 10 km radius from the proposal site.
4. Present land use shall be prepared based on satellite imagery. High-resolution satellite image data having 1m-5m spatial resolution like quickbird, Ikonos, IRS P-6 pan sharpened etc. for the 10 Km radius area from proposed site. The same shall be used for land used/land-cover mapping of the area.
5. If the raw materials used have trace elements, an environment management plan shall also be included.
6. Plan for the implementation of the recommendations made for the cement plants in the CREP guidelines must be prepared.
7. Energy consumption per ton of clinker and cement grinding
8. Provision of waste heat recovery boiler
9. Arrangement for use of hazardous waste

ANNEXURE-I: COPY OF EC LETTER /
7CA D@5B7 9F9DC FH'

F. No. J-11011/547/2010-IA-II (I)
Government of India
Ministry of Environment and Forests
(I.A. Division)

Paryavaran Bhawan
CGO Complex, Lodhi Road
New Delhi – 110 003

E-mail: ms.industry-mef@nic.in

Tele/fax: 011 – 2436 3973

Dated: 23rd June, 2011

To,

M/s Ambuja Cements Limited
Jaladhulagori, Village & P.O. Dhulagori,
P.S. Sankrail, District Howrah - 711 302,
West Bengal

Ph: 033- 6499 1280

Fax: 033- 2679 8423

E-mail: samir.sadhu@ambujacement.com

Sub: Modernization/expansion of existing cement grinding unit (from 1.50 MTPA to 2.40 MTPA) at Village Jala Dhulagori, Tehsil Sankrail, District Howrah in West Bengal by **M/s Ambuja Cements Limited (ACL) - regarding Environmental Clearance**

Sir,

This has reference to your letter no. nil dated 22.03.2011 along with copies of EIA/EMP reports seeking environmental clearance under the provisions of EIA Notification, 2006.

2. The Ministry of Environment and Forests has examined your application. It is noted that M/s. Ambuja Cements Ltd. have proposed for modernization/expansion of existing cement grinding unit (from 1.50 MTPA to 2.40 MTPA) at Village Jala Dhulagori, Tehsil Sankrail, District Howrah in West Bengal. This capacity enhancement of 0.9 MTPA will be achieved by installation of roller press in cement mill no.1 and two additional packers of 240 TPH capacity each. Total land area for the clinker grinding unit is 18.36 ha, out of which 3.82 ha has been developed under green belt/plantation and 0.67 ha of additional area will be developed under green belt. No additional land is required for the proposed expansion. Clinker (15,60,000 TPA), Gypsum (1,20,000 TPA), Fly ash (7,20,000 TPA) will be required as raw material after expansion of cement grinding capacity

3. No national park/wildlife sanctuary/biosphere reserve is located within 10 km. radius of the project site. No R & R plan is applicable in this project. River Hoogly flows at 4.5 Km distance in the SE direction from the project site. Sarenga Nallah is at a distance of approx 6 km in SSE of the plant site. Total cost of the project is Rs. 250 Crores. Capital cost for EMP has been estimated as Rs. 2.0 Crores. Besides, Rs.10.0 Crores to modify for unidirectional traffic movement to / from packing plant & 6.0 crores wagon loading arrangement has been earmarked and Rs. 0.20 Crores/annum has been earmarked towards total capital cost & recurring cost/annum respectively for environmental pollution control measures.

4. To control particulate emissions, bag filters would be installed. Fly ash & clinker are stored in silos, gypsum is stored in covered shed. Regular water sprinkling will be carried on haulage road. Transportation of fly ash will be in the

close bunkers and unloaded pneumatically to the silo and fly ash bin will be fitted with bag filters.

5. Total water requirement after proposed expansion will be 270 m³/day, which will be sourced from ground water. No industrial wastewater will be generated from the cement grinding process. Domestic waste water will be treated in the STP and treated water will be used for gardening & dust suppression within plant boundary. There will be no discharge outside the plant premises.

6. No solid waste will be generated from the grinding unit and the dust collected by dust collectors will be recycled in the process.

7. The stand alone cement grinding units are covered under Category 'B' as per para 3(b) of the Schedule of the EIA notification 2006, but due to the existence of Jalan Industrial Complex, Howrah, being Critically Polluted area, within 10 km from the Proposed project boundary, the proposal was appraised by Expert Appraisal Committee as per the general condition of the EIA Notification, 2006.

8. The proposal was considered by the Expert Appraisal Committee-1 (Industry) in its 24th meeting held during 19th - 20th May, 2011. The Committee recommended the proposal for environmental clearance subject to stipulation of specific conditions along with other environmental conditions. Public hearing was exempted by categorizing the project as B2 category.

9. Based on the information submitted by you, presentation made by you and consultant, M/s JM EnviroNet Pvt. Ltd., Gurgaon, the Ministry of Environment and Forests hereby accords environmental clearance to the above project under the provisions of EIA Notification dated 14th September 2006 subject to strict compliance of the following Specific and General conditions:

A. SPECIFIC CONDITIONS :

- i. Particulate emissions shall be controlled within 50 mg/Nm³ by installing adequate air pollution control system viz. Bag filters and stacks of adequate height etc. Data on ambient air, fugitive and stack emissions shall be submitted to the Ministry's Regional Office at Bhubaneswar, SPCB and CPCB regularly.
- ii. The National Ambient Air Quality Standards issued by the Ministry vide G.S.R. No. 826(E) dated 16th November, 2009 should be followed.
- iii. Gaseous emissions including secondary fugitive emissions from all the sources shall be controlled within the latest permissible limits issued by the Ministry and regularly monitored. Guidelines/Code of Practice issued by the CPCB should be followed.
- iv. The company shall install adequate dust collection and extraction system to control fugitive dust emissions at various transfer points, raw mill handling (unloading, conveying, transporting, stacking), vehicular movement, bagging and packing areas etc. All the raw material stock piles should be covered. A closed clinker stockpile system shall be provided. All conveyers should be

covered with GI sheets. Covered sheds for storage of raw materials and fully covered conveyers for transportation of materials shall be provided besides coal, cement, fly ash and clinker shall be stored in silos. Pneumatic system shall be used for fly ash handling.

- v. Asphalting/concreting of roads and water spray all around the stockyard and loading/unloading areas in the cement plant shall be carried out to control fugitive emissions. Regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of SPM and RSPM such as haul road, loading and unloading points, transfer points and other vulnerable areas. It shall be ensured that the ambient air quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.
- vi. Efforts shall be made to reduce impact of the transport of the raw materials and end products on the surrounding environment including agricultural land. All the raw materials including fly ash should be transported in the closed containers only and should not be overloaded. Vehicular emissions should be regularly monitored.
- vii. Total ground water requirement shall not exceed 270m³/day and necessary permission from the competent authority for the drawl of water shall be obtained. Efforts shall be made to further reduce water consumption by using air cooled condensers. All the treated wastewater should be recycled and reused in the process and/or for dust suppression and green belt development and other plant related activities etc. No process wastewater shall be discharged outside the factory premises and 'zero' discharge should be adopted.
- viii. Efforts shall be made to make use of rain water harvested. If needed, capacity of the reservoir shall be enhanced to meet the maximum water requirement. Only balance water requirement shall be met from other sources.
- ix. All the bag filter dust, raw meal dust, coal dust, clinker dust and cement dust from pollution control devices should be recycled and reused in the process used for cement manufacturing. Spent oil and batteries should be sold to authorized recyclers / reproprocessors only.
- x. Green belt shall be developed in at least 33 % area in and around the cement plant as per the CPCB guidelines to mitigate the effects of air emissions in consultation with local DFO.
- xi. At least 5 % of the total cost of the project shall be earmarked towards the Enterprise Social Commitment based on locals need and item-wise details along with time bound action plan should be prepared and submitted to the Ministry's Regional Office at Bhubaneswar. Implementation of such program should be ensured accordingly in a time bound manner.

B. GENERAL CONDITIONS:

- i. The project authorities must strictly adhere to the stipulations made by the West Bengal Pollution Control Board and the State Government.

- ii. No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment and Forests.
- iii. The gaseous emissions from various process units shall conform to the load/mass based standards notified by this Ministry on 19th May, 1993 and standards prescribed from time to time. The State Pollution Control Board may specify more stringent standards for the relevant parameters keeping in view the nature of the industry and its size and location.
- iv. At least four ambient air quality monitoring stations should be established in the downward direction as well as where maximum ground level concentration of PM₁₀, SO₂ and NO_x are anticipated in consultation with the SPCB. Data on ambient air quality and stack emission shall be regularly submitted to this Ministry including its Regional Office at Bhubaneswar and the SPCB/CPCB once in six months.
- v. Industrial wastewater shall be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May, 1993 and 31st December, 1993 or as amended from time to time. The treated wastewater shall be utilized for plantation purpose.
- vi. The overall noise levels in and around the plant area shall be kept well within the standards (85 dBA) by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (daytime) and 70 dBA (nighttime).
- vii. Occupational health surveillance of the workers should be done on a regular basis and records maintained as per the Factories Act.
- viii. The company shall develop surface water harvesting structures to harvest the rain water for utilization in the lean season besides recharging the ground water table.
- ix. The project proponent shall also comply with all the environmental protection measures and safeguards recommended in the EIA/EMP report. Further, the company must undertake socio-economic development activities in the surrounding villages like community development programmes, educational programmes, drinking water supply and health care etc.
- x. As proposed, Rs 2.0 Crores and Rs. 0.20 Crores shall be earmarked towards capital cost and recurring cost/annum for environment pollution control measures to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government. An implementation schedule for implementing all the conditions stipulated herein shall be submitted to the Regional Office of the Ministry at Bhubaneswar. The funds so provided shall not be diverted for any other purpose.

- xi. A copy of clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parishad/Municipal Corporation, Urban Local Body and the local NGO, if any, from whom suggestions/representations, if any, were received while processing the proposal. The clearance letter shall also be put on the web site of the company by the proponent.
 - xii. The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the MOEF at Bhubaneswar. The respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely; PM₁₀, SO₂, NO_x (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the projects shall be monitored and displayed at a convenient location near the main gate of the company in the public domain.
 - xiii. The project proponent shall also submit six monthly reports on the status of the compliance of the stipulated environmental conditions including results of monitored data (both in hard copies as well as by e-mail) to the Regional Office of MOEF, the respective Zonal Office of CPCB and the SPCB. The Regional Office of this Ministry at Bhubaneswar / CPCB / SPCB shall monitor the stipulated conditions.
 - xiv. The environmental statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company alongwith the status of compliance of environmental conditions and shall also be sent to the respective Regional Office of the MOEF at Bhubaneswar by e-mail.
 - xv. The Project Proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB and may also be seen at Website of the Ministry of Environment and Forests at <http://envfor.nic.in>. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same should be forwarded to the Regional office at Bhubaneswar.
 - xvi. Project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work.
10. The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.
11. The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.

12. The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008 and the Public (Insurance) Liability Act, 1991 along with their amendments and rules.

P. Ahujara
(Dr. P.L. Ahujarai)
Scientist 'F'

Copy to:

1. The Secretary, Department of Environment, Govt. of West Bengal, Kolkata, West Bengal.
2. The Chairman, Central Pollution Control Board, Parivesh Bhavan, CBD-cum-Office Complex, East Arjun Nagar, Delhi-110032.
3. The Chairman, West Bengal Pollution Control Board, Parivesh Bhawan, 10A Block-LA, Sector-III, Salt Lake, Kolkata - 700091, West Bengal.
4. The Chief Conservator of Forests, Regional Office (EZ), Ministry of Environment and Forests A-3, Chandrashekharapur, Bhubaneswar - 751 023, Orissa
5. Guard File/ Monitoring File / Record File.

1
(Dr. P.L. Ahujarai)
Scientist 'F'



भारत सरकार/**Government of India**
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
Ministry of Environment, Forest & Climate Change
एकीकृत क्षेत्रीय कार्यालय
Integrated Regional Office
कोलकाता/**Kolkata-700106**
Email: iro.kolkata-mefcc@gov.in



No. 102-428/11/EPE/321

Date: 25.07.2022

To,

Dr. R. B. Lal,
Scientist-E, Industry-I,
Ministry of Environment, Forest and Climate Change,
Indira Paryavaran Bhawan,
Jorbagh Road, Aliganj,
New Delhi – 110 003.
(E-mail: rb.lal@nic.in)

Sub: Modernisation/Expansion of existing Cement Grinding Unit (from 1.50 MTPA to 2.40 MTPA) at village Jala Dhulagori, Tehsil Sankrail, District Howrah, West Bengal by M/s Ambuja Cements Ltd. (ACL) – reg.

Ref: EC letter no. J-11011/547/2010-IA II (I) dated 23.06.2011.

Sir,

I am directed to draw your kind attention to the subject and reference letter cited above and to state that the above project was monitored by the undersigned on 28.04.2022 for issuance of Certified Compliance Report. Based on the observations made while monitoring of the project, the detailed Certified Compliance Report has been prepared and enclosed for kind information and further needful action.

Yours faithfully,

Encl: As above

Dr. Shahida Parvin

(डॉ. शाहिदा परवीन काज़ी/ Dr. Shahida Parvin Quazi)
(वैज्ञानिक- ई/ Scientist-E)

डा. शाहिदा परवीन काज़ी/DR. SHAHIDA PARVIN QUAZI
वैज्ञानिक - ई/SCIENTIST - E
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE
एकीकृत क्षेत्रीय कार्यालय/INTEGRATED REGIONAL OFFICE
आई बी-198, सेक्टर-III, साल्ट लेक सिटी, कोलकाता-700106
IB-198, SECTOR-III, SALT LAKE CITY, KOLKATA - 700106

81-108, SECTOR III, SALT LAKE CITY, UTAH - 84106
 800-448-4433 (TOLL FREE) - 24 HOURS
 PAPERWORK: STATE AND/OR INTEGRATED REGIONAL SERVICE
 MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE
 URBANITY, LAND AND RURAL DEVELOPMENT
 1-800-448-4433 (TOLL FREE)
 81-108, SECTOR III, SALT LAKE CITY, UTAH - 84106



भारत सरकार / Government of India
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
Ministry of Environment, Forest & Climate Change
एकीकृत क्षेत्रीय कार्यालय
Integrated Regional Office
कोलकाता / Kolkata-700106
Phone-033-2335-5713/7938 Fax-2335-5904
Email: iro.kolkata-mefcc@gov.in



प्रमाणित अनुपालन रिपोर्ट / Certified Compliance Report

SN	Item	Details
1.	परियोजना का प्रकार Type of Project	Industry-1
2.	परियोजना का नाम Name of Project	Modernization/expansion of existing cement grinding unit (from 1.50 MTPA to 2.40 MTPA) at Village Jala Dhulagori, Tehsil Sankrail, District Howrah in West Bengal by M/s Ambuja Cements Ltd. (ACL)
3.	परियोजना प्राधिकरण का पता Address of project authorities	M/s Ambuja Cements Limited, Jaladhulagori, Village & P.O. Dhulagori, P.S. Sankrail, District Howrah -711302, West Bengal, Phn: 033-64991280, Fax: 033-26798423, e-mail: samir.sadhu@ambujacement.com
4.	पर्यावरणीय स्वीकृति पत्र सं० तथा तिथि Env. Clearance Letter No. & Date	J-11011/547/2010-IA II (I) dated 23.06.2011
5.	क्षेत्रीय कार्यालय संचिका सं० Regional Office File No.	102-428/11/EPE
6.	स्थल दौरा तिथि Date of Site Visit	28.04.2022
7.	परियोजना की स्थिति Status of Project	Operational
8.	उपलब्ध कर्मचारी Persons available	1. Shri Bhimsi Kachhot (Unit Head) 2. Sounita Sinha (Assistant Manager) 3. Shri Prashant Upadhyaya (HR Head) 4. Yashpal Sharma (HR Head) 5. Amitesh Chanda (Team Lead -Ambuja Cements Foundation)
9.	निगरानी अधिकारी Monitoring Officer	1. Dr. Shahida Parvin Quazi, Scientist E

10. परियोजना की वर्तमान स्थिति / Present status of the Project:

Ministry accorded EC to M/s Ambuja Cements Limited for modernization/expansion of existing cement grinding unit (from 1.5 MTPA to 2.40 MTPA) vide letter no. J-11011/547/2010-IA-II (I) dated 23.06.2011. As per information provided, the different units and their commission date are as follows:

Sl No.	Equipment	Commissioning Date
1	Cement Mill-1	31.01.2001
2	Cement Mill-2	30.04.2001
3	Roller Press	24.05.2016
4	DG	31.01.2001
5	Packer-1 &2	31.01.2001
6	Packer- 3&4	24.05.2016

Further, the production details are as follows for the following years: 2021: 2220054 MT, 2020: 1938117 MT and 2019: 2036297 MT. It has been observed that the Project Authorities (PAs) have complied or are in process of complying with the conditions stipulated in EC. The detailed observations are as follows:

11. अनुबंधित स्थितियाँ / Stipulated Conditions:

J-11011/547/2010-IA II (I) dated 23.06.2011

A. SPECIFIC CONDITIONS:

- i. **Particulate emissions shall be controlled within 50 mg/Nm³ by installing adequate air pollution control system viz., Bag filters and stacks of adequate height etc. Data on ambient air, fugitive and stack emissions shall be submitted to the Ministry's Regional Office at Bhubaneswar, SPCB and CPCB regularly.**

Status: Being complied. PAs have installed bag filters. It was observed that silos have been provided with bag filters, all packing machines are with bag filters. Continuous emission monitoring stations have been provided at the following location: 1) Roller Press, 2) CM1 Mill Bag Filter stack, 3) CM2 Mill Bag Filter stack, 4) CM2 Sep Bag Filter stack, 5) Wagon tippler stack, 6) Packer -1 stack, 7) Packer -2 stack, 8) Packer -3 bag filter stack, Packer -4 bag filter stack, CLK Hpr-1 bag filter stack, CLK-Hpr -2 bag filter stack Manual monitoring of stack emission has been conducted by R. V. Briggs & Co. Pvt. Ltd. As per the monitoring data submitted by PAs, PM is below the stipulated standard of 30 mg/Nm³ for all stacks. From available records it is observed that PAs are regular in submitting data on ambient air, fugitive and stack emission to the Ministry's Regional Office.

- ii. **The National Ambient Air Quality Standards issued by the Ministry Vide G.S.R. No. 826 (E) dated 16th November, 2009 should be followed.**

Status: Partially complied. It is observed that ambient air quality monitoring is being conducted at four locations: near RO plant, near contractors' room, near railway gate and near transport office. Monitoring has been conducted for the following parameters: PM_{2.5}, PM₁₀, SO₂, NO₂, CO and the results are within the stipulated standard. It is observed that PAs have not monitored O₃, Pb, NH₃, C₆H₆, BAP, As, Ni. **It is required to monitor all the parameters as mentioned in the G.S.R. No. 826 (E) dated 16th November, 2009.** PAs have also installed one continuous ambient air quality monitoring station. The ambient air quality data as submitted by PAs is furnished below:

Sl. No.	Date of Study	Location	Average Result			
			PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	SO ₂ (µg/m ³)	NO ₂ (µg/m ³)
1	January, 2022	Near RO Plant	52	84	<4.0	24.6
2		Near Contractor's Room	59	92	4.2	22.2
3		Near Railway Gate	58	98	4.7	24.9
4		Near Transport Office	54	93	4.5	23.3

J-11011/547/2010-IA II (I) dated 23.06.2011

Q. Shahida Pasuik

5	September, 2021	Near RO Plant	47	78	5.4	23.1
6		Near Contractor's Room	37	53	5.5	20.8
7		Near Railway Gate	51	87	5.9	21.4
8		Near Transport Office	35	51	5.1	18.5

- iii. **Gaseous emissions including secondary fugitive emissions from all the sources shall be controlled within the latest permissible limits issued by the Ministry and regularly monitored. Guidelines/Code of practice issued by the CPCB should be followed.**

Status: It is observed that fugitive emissions is being monitored at the following locations: 1) Cement mill (ground floor), 2) Packer 1 and 2 (ground floor), 3) Packer 3 and 4 (ground floor), 4) Hopper building (west side), 5) Physical building (west side), 6) Roller press, 7) Clinker silo (stock side & gypsum shed between area), 8) Loading bay, 9) FA unloading area, 10) Wagon Trippler. Fugitive emission data is observed to be within the stipulated parameter as per Factories Act 1948 (Second Schedule).

- iv. **The company shall install adequate dust collection and extraction system to control fugitive dust emissions at various transfer points, raw mill handling (unloading, conveying, transporting, stacking), vehicular movement, bagging and packing areas etc. All the raw material stock piles should be covered. A closed clinker stockpile system shall be provided. All conveyers should be covered with GI sheets. Covered sheds for storage of raw materials and fully covered conveyers for transportation of materials shall be provided besides coal, cement, fly ash and clinker shall be stored in silos. Pneumatic system shall be used for fly ash handling.**

Status: Being complied. The unit is a cement grinding unit only and raw mill has not been installed. It is observed that at the transfer points and storage silos have been provided with dust collection and extraction systems. There are two no. silos of 25,000 MT each for clinker storage, 4000 MT silo for fly ash storage, 4 nos. cement silos of 5000 MT each for storage of finished cement. Gypsum stock piles were observed to be stored under covered shed. Further, conveyors are covered with GI sheets. Fly ash is handled through pneumatic system.

- v. **Asphalting/concreting of roads and water spray all, around the stockyard and loading/unloading areas in the cement plant shall be carried out to control fugitive emissions. Regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of SPM and RSPM such as haul road, loading and unloading points, transfer points and other vulnerable areas. It shall be ensured that the ambient air quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.**

Status: Being complied. It was observed that internal roads and open areas in the plant area are concreted/ pitched. PAs informed that vehicle movement is allowed only through specific routes. Automatic road sweeping machine is present. Water sprinkling is undertaken at the raw material stock yards, cement bag loading areas, truck yard and roads.

- vi. **Efforts shall be made to reduce impact of the transport of the raw materials and end products on the surrounding environment including agricultural land. All the raw materials including fly ash should be transported in the closed containers only and should not be overloaded. Vehicular emissions should be regularly monitored.**

Status: Being complied. As per information provided and discussion held and observations made, clinker, slag and conditioned fly ash are transported to the plant

using railway transportation. Dry fly-ash is transported through closed bulkers only PAs informed that vehicular emission is regularly monitored at main gate through checking vehicle Pollution Certificate under PUC norms.

- vii. **Total ground water requirement shall not exceed 270 m³/day and necessary permission from the competent authority for the drawl of water shall be obtained. Efforts shall be made to further reduce water consumption by using air cooled condensers. All the treated wastewater should be recycled and reused in the process and/or for dust suppression and green belt development and other plant related activities etc. No process wastewater shall be discharged outside the factory premises and 'zero' discharge should be adopted.**

Status: Being complied. PAs have informed that ground water consumption do not exceed 270 m³/day. Water consumption from January,2021 to December,2021 submitted by PAs is furnished below:

Month	Total water consumption(m ³)
January, 2021	5389
February, 2021	5616
March, 2021	5203
April, 2021	5432
May, 2021	4689
June, 2021	4595
July, 2021	5518
August, 2021	5779
September, 2021	5759
October, 2021	6315
November, 2021	5485
December, 2021	4346

PAs have obtained permission from Ground Water Resources Development Authority, Government of West Bengal, vide permit no. P060900201074000000ITLE dated 21.06.2011 and vide permit no. P060900201963000000ITSE dated 13.2.2012. Cement grinding process is a dry process and no process waste water is generated. It has been informed that only domestic waste water is generated which is used for plantation, sprinklers.

- viii. **Efforts shall be made to make use of rain water harvested. If needed, capacity of the reservoir shall be enhanced to meet the maximum water requirement. Only balance water requirement shall be met from other sources.**

Status: PAs have made provision in colony building roof top for the purpose of roof top rain water harvesting. The rooftops are connected with reservoir with capacity 5KL.

- ix. **All the bag filter dust, raw meal dust, coal dust, clinker dust and cement dust from pollution control devices should be recycled and reused in the process used for cement manufacturing. Spent oil and batteries should be sold to authorize recyclers/ re-processors only.**

Status: Being complied. PAs have informed that all the bag filter dust, clinker dust and cement dust from pollution control devices are recycled and reused in the process used for cement manufacturing. It was further stated that spent oil is sold to authorize recycles/ re-processors only and batteries are recycled under buy-back scheme by the suppliers.

- x. **Green belt shall be developed in at least 33% area in and around the cement plant**

J-11011/547/2010-IA II (I) dated 23.06.2011

as per the CPCB guidelines to mitigate the effects of air emissions in consultation with local DFO.

Status: Being complied. Green belt development is satisfactory. As per information provided by PAs, it is observed that out of 24.44 Ha of plant area, green belt has been developed in 8.46 Ha. Plantation details for the last three years are submitted below:

Year	Name of the Species Planted in plant premises	Quantity
2022 – till June, 2022 (further planning during the monsoon)	1. Akashmoni 2. Mehgoni 3. Kadam	871
2021	1. Akshmoni 2. Mehgoni 3. Sisoo 4. Jackfruit 5. Mango	707
2020	1. Akshmoni 2. Mehgoni 3. Sisoo	190



- xi. At least 5% of the total cost of the project shall be earmarked towards the Enterprise Social Commitment based on locals need and item-wise details along with time bound action plan should be prepared and submitted to the Ministry's Regional Office at Bhubaneswar. Implementation of such programme should be ensured accordingly in a time bound manner.

Status: PAs have taken various activities towards enterprise social commitment. As per information provided, the CSR activities undertaken for the last three years and are furnished below:

SL NO	YEAR	EXPENSES AMOUNT	MAJOR ACTIVITY	AMOUNT
1	2019	11915026.5	Agro-based Livelihood Promotion	2936369.00
			Establishment Expenses	793737.50
			Goat & Poultry Project -Nabard	787621.00
			Health Care Centre	1342892.00
			Health & Sanitation	609380.00
			Rural Infrastructure Development	2489287.00
			Skill & Entrepreneurship Development Inst.	2346187.00
			Women Empowerment	609553.00

2	2020	14341394	Agro-based Livelihood Promotion	2340170.00
			Establishment Expenses	1171979.50
			Goat & Poultry Project -Nabard	1005256.00
			Health Care Centre	1315792.50
			Health &Sanitation	727678.00
			Nabard Abl Project	1127283.00
			Nabard Skill Training 2020-21	1530086.00
			Nabard Skill Training 22-23	3282.00
			Rural Infrastructure Development	2455583.00
			Skill & Entrepreneurship Development Inst.	2226372.00
			Women Empowerment	437912.00
			3	2021
Establishment Expenses	1838254.80			
Goat & Poultry Project -Nabard	659544.00			
Health Care Centre	1315641.10			
Health &Sanitation	695538.00			
IDH Project	66282.00			
Rural Infrastructure Development	2639442.00			
Skill & Entrepreneurship Development Inst.	7253203.31			
Women Empowerment	923118.00			
Total expense last three year		4,50,99,666.24		18843245.74

B. GENERAL CONDITIONS

- i. **The project authorities must strictly adhere to the stipulations made by the West Bengal Pollution Control Board and the State Government.**

Status: Agreed with. PAs have received consent to operate vide consent letter no. C0128916 and memo number 180-PCB/How/812-2000 dated 12.02.2020 with validity till 30.04.2024.

- ii. **No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment and Forests.**

Status: Agreed with. PAs have received TOR from the Ministry vide letter no. J-11011/547/2010-IA II (I) dated 15.02.2022.

- iii. **The gaseous emissions from various process units shall conform to the load/mass based standards notified by this Ministry on 19th May, 1993 and standards prescribed from time to time. The State Pollution Control Board may specify more stringent standards for the relevant parameters keeping in view the nature of the industry and its size and location.**

Status: No gaseous emission is warranted during process, since it is a cement grinding unit.

- iv. **At least four ambient air quality monitoring stations should be established in the downward direction as well as where maximum ground level concentration of PM₁₀, SO₂ and NO_x are anticipated in consultation with the SPCB. Data on ambient air quality and stack emission shall be regularly submitted to this Ministry including its Regional Office at Bhubaneswar and the SPCB/CPCB once in six months.**

Status: Being complied. It is observed that ambient air quality monitoring is being conducted at four locations: near RO plant, near contractors' room, near railway gate, near transport office. Monitoring has been conducted for the following parameters: PM_{2.5}, PM₁₀, SO₂, NO₂, CO and the results are within the stipulated standard. PAs have also installed one continuous ambient air quality monitoring station. From available records, it is observed that PAs are regular in submitting ambient air quality data and stack emission data along with six monthly compliance reports to the Regional Office.

- v. **Industrial wastewater shall be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May, 1993 and 31st December, 1993 or as amended from time to time. The treated wastewater shall be utilized for plantation purpose.**

Status: The unit is a cement grinding unit and no industrial waste water is generated as it a dry process. Domestic waste water is collected in sewage treatment plant [zero discharge concepts] and recycled and reused to minimize fresh water usage. PAs have informed that water discharged from STP is being used for gardening & dust suppression.

- vi. **The overall noise levels in and around the plant area shall be kept well within the standards (85 dB(A)) by providing noise control measures including acoustic hoods, silencers, enclosures etc. On all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under EPA Rules, 1989, viz. 75 dB(A) (day time) and 70 dB(A) (night time).**

Status: Partially complied. It is observed that ambient noise level has been monitored near the main gate with the data being: day time: 60.1 dB(A) and night time 58.2 dB(A). Further, PAs have monitored noise monitoring at the following work zone locations: 1) Incoming WB, 2) Track yard 1 (near canteen), 3) Loading bay, 4) E & I workshop, 5) Mechanical shop, 6) Near wagon tippler, 7) Compressor room, 8) Inside physical lab, 9) Between mill 1 & 2. ***The noise monitoring data is within 85 dB(A) for all the work zone locations except between mill 1 & 2 (99.3 dB(A)). PAs need to take action to bring down the noise level below 85 dB(A).***

- vii. **Occupational health surveillance of the workers should be done on a regular basis and records maintained as per the Factories Act.**

Status: Being complied. As per information provided and discussion held during monitoring, it is observed that health checkup of all employee including contractual workmen has been conducted regularly as per Factories Act. Records are being maintained.

- viii. **The company shall develop surface water harvesting structures to harvest the rain water for utilization in the lean season besides recharging the ground water table.**

Status: As per information Ground water recharging is not permissible as per the NOC of West Bengal Pollution Control Board. PAs have informed that water savings done through Systematic Rice Intensification (SRI) cultivation and rain water harvesting by digging pond in the villages by Ambuja Cements Limited. It has also been stated that as per NOC from State Pollution Control Board that ground water recharging is not permissible.

- ix. **The project proponent shall also comply with all the environmental protection measures and safeguards recommended in the EIA/ EMP report. Further, the company must undertake socio-economic development activities in the surrounding villages like community development programmes, educational programmes, drinking water supply and health care etc.**

Status: Being complied. PAs are complying/ in the process of complying with the environmental protection measures and safeguards. Further from the information provided, it is observed that they have undertaken various activities for socio-economic development which is furnished below:

SL NO	YEAR	EXPENSES AMOUNT	MAJOR ACTIVITY	AMOUNT
1	2019	11915026.5	Agro-based Livelihood Promotion	2936369.00
			Establishment Expenses	793737.50
			Goat & Poultry Project -Nabard	787621.00
			Health Care Centre	1342892.00
			Health &Sanitation	609380.00
			Rural Infrastructure Development	2489287.00
			Skill & Entrepreneurship Development Inst.	2346187.00
			Women Empowerment	609553.00
2	2020	14341394	Agro-based Livelihood Promotion	2340170.00
			Establishment Expenses	1171979.50
			Goat & Poultry Project -Nabard	1005256.00
			Health Care Centre	1315792.50
			Health &Sanitation	727678.00
			Nabard Abl Project	1127283.00
			Nabard Skill Training 2020-21	1530086.00
			Nabard Skill Training 22-23	3282.00
			Rural Infrastructure Development	2455583.00
			Skill & Entrepreneurship Development Inst.	2226372.00
			Women Empowerment	437912.00
3	2021	18843245.74	Agro-based Livelihood Promotion	3452222.53
			Establishment Expenses	1838254.80
			Goat & Poultry Project -Nabard	659544.00
			Health Care Centre	1315641.10
			Health &Sanitation	695538.00
			IDH Project	66282.00
			Rural Infrastructure Development	2639442.00
			Skill & Entrepreneurship Development Inst.	7253203.31
			Women Empowerment	923118.00
Total expense last three year		4,50,99,666.24		18843245.74

- x. **As proposed, Rs. 2.0 Crores and Rs. 0.20 Crores shall be earmarked towards capital cost and recurring cost/annum for environment pollution control measures to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government. An implementation schedule for implementing all the conditions stipulated herein shall be submitted to the Regional Office of the Ministry at Bhubaneswar. The funds so provided shall not be diverted for any other purpose.**

Status: Being complied. PAs have informed that the total expenditure from April, 2021 to September, 2021, towards pollution control measure and environment upkeepment is INR. 40,25,035/- including the cost incurred to maintain the bag filters during this period is Rs. 5,95,698/-. Further, for the period of October, 2021 to March, 2022, the total expenditure towards pollution control measures and environment upkeepment is INR 36,00,000/- during October, 2021 to March, 2022.

- xi. **A copy of clearance letter shall be sent by the proponent to concerned Panchayat, Zilla Parishad/Municipal Corporation, Urban Local Body and the local NGO, if any, from whom suggestions/representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the company by the proponent.**

Status: Partially complied. It has been stated that the copies of clearance letter has been sent to Dhulagori Gram Panchayat on dt. 20/08/2011, Zilla Parishad on dt. 20/08/2011. ***PAs need to submit the letter sent to Dhulagori Gram Panchayat and Zilla Parishad dated 20.08.2011.*** Further, it is observed that the EC letter has been uploaded in their website.

- xii. **The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the MoEF at Bhubaneswar. The respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely PM₁₀, SO₂, NO_x (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the projects shall be monitored and displayed at a convenient location near the main gate of the company in the public domain.**

Status: Being complied. It is observed that PAs have uploaded the status of compliance of the stipulated clearance conditions (<https://www.ambujacement.com/Sustainability/environment-data>). From available records, it is observed that PAs are regular in submitting six monthly compliance reports. The criteria pollutant levels have been displayed in the display board.

- xiii. **The project proponent shall also submit six monthly reports on the status of the compliance of the stipulated environmental conditions including results of monitored data (both in hard copies as well as by e-mail) to the Regional Office of MoEF, the respective Zonal Office of CPCB and the SPCB. The Regional Office of this Ministry at Bhubaneswar/ CPCB/ SPCB shall monitor the stipulated conditions.**

Status: Being complied. From available records it is observed that PAs are regular in submitting six monthly compliance reports.

- xiv. **The environmental statement for each financial year ending 31st March in Form- V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company**

along with the status of compliance of environmental conditions and shall also be sent to the respective Regional Office of the MoEF at Bhubaneswar by e-mail.

Status: Being complied. PAs have submitted a copy of the environmental statement.

- xv. The project proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB and may also be seen at Website of the Ministry of Environment and Forests at <http://envfor.nic.in> This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same should be forwarded to the Regional Office at Bhubaneswar.

Status: Being complied. PAs have advertised the EC letter in two newspapers: The Statesman (English) on 28th June, 2011 and Sangbad Pratidin (Bengali) on 29th June, 2011.

- xvi. Project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work.

Status: PAs have submitted a copy of acknowledgement receipt with respect to commencement of commercial production. Further it has been informed that expansion project was financed through internal accruals.

10. The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.

Status: Agreed with.

11. The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.

Status: Agreed with.

12. The above conditions shall be enforced inter alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous Wastes (Management, Handling and Trans-boundary Movement) Rules, 2008 and the Public (Insurance) Liability Act, 1991 along with their amendments and rules.

Status: Agreed with.

12. पर्यवेक्षण / Observations:

1. It is required to monitor all the parameters as mentioned in the G.S.R. No. 826 (E) dated 16th November, 2009. **(Specific Conditions ii)**
2. The noise monitoring data is within 85 dB(A) for all the work zone locations except between mill 1 & 2 (99.3 dB(A)). PAs need to take action to bring down the noise level below 85 dB(A). **(General Conditions vi)**

g. Shahida Pravin

3. PAs need to submit the letter sent to Dhulagori Gram Panchayat and Zilla Parishad dated 20.08.2011. (**General condition xi**)

13. अनुशंसा / Recommendations:

This project can be put up in the following tick-marked category of compliance status.

- Compliance status could not be judged as the project was shut down/ not in operational during the site visit.
- No non-compliances detected. No further action is required.
- ✓ **Non-compliances detected (not of immediate danger to health & safety of the people). Letter issued to project authorities for taking corrective measures.**
- Serious non-compliances detected. Recommended to issue a Show-Cause Notice to Project Authorities.

Dr. Shahida Parvin Quazi

(डॉ. शाहिदा परवीन काज़ी/ Dr. Shahida Parvin Quazi)
वैज्ञानिक-ई / Scientist-E

डॉ. शाहिदा परवीन काज़ी/ DR. SHAHIDA PARVIN QUAZI
वैज्ञानिक - ई/ SCIENTIST - E
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE
एकीकृत क्षेत्रीय कार्यालय/INTEGRATED REGIONAL OFFICE
आई बी-198, सेक्टर-III, सॉल्ट लेक सिटी, कोलकाता-700106
IB-198, SECTOR-III, SALT LAKE CITY, KOLKATA - 700106

DR. SHANIDA PARVIN QUASI
3 - T21TH3102 \ ई - कर्मिणी
पर्यावरण, वन एवं जलवायु विभाग में
MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE
एकीकृत स्थिति कागजात/INTEGRATED REGIONAL OFFICE
आइ ई-198, मंड-III, सोल लैक सिटी, कोलकाता-700106
19-198, SECTOR-III, SALT LAKE CITY, KOLKATA - 700106

ANNEXURE-II : CTO COMPLIANCE REPORT

Ambuja Cement

ACL/SK/ENV/07-22/04

Date: 27.07.2022

To

The West Bengal Pollution Control Board,
(Department of Environment, Govt. of West Bengal)
Howrah Regional Office,
Minority Bhawan, 5th Floor,
Near Alipore Police Court,
Kolkata- 700027, West Bengal

28.07.2022
Received
Contents Not Verified
W. B. Pollution Control Board
Howrah Regional Office

Kind Attn: Mrs. Barna Majumder - Regional Officer (Howrah Regional Office)

Sub: Compliance of Consent to Operate

Reference Memo Number : 180-PCB/HOW/812-2000 dated 12/02/2020

Dear Madam,

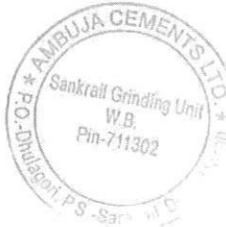
We are submitting compliance report for our Consent to Operate as June-2022 I.
Kindly acknowledge the receipt and provide compliance certificate.

Thanking you,
Yours faithfully,

For Ambuja Cements Ltd.

Unit: Sankrail


(Bhimsi Kachhot)
Vice President & Unit Head
ACL Sankrail unit



Encl: Annexure-1,2,3,4,5

AMBUJA CEMENTS LIMITED

Unit : Sankrail

Jaladhulagori, Vill. & P.O. : Dhulagori, P.S. : Sankrail, Dist. : Howrah (W.B.) - 711302

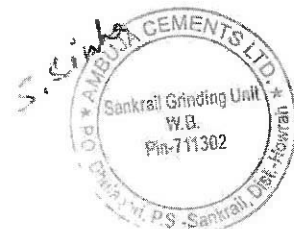
Phone : 033 - 6608 7100 (4 Lines), Fax : 033 2679 8423

(Regional Off. : "INDICON VIVA", 6th Floor, 53A, Leela Roy Sarani, Kolkata - 700 019, Phone : 033 - 4403 3900, Fax : 2461 7744 / 8413)

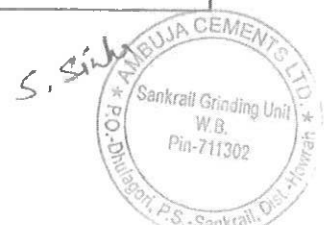
(Regd. Off. : P.O. : Ambujanagar, Taluka : Kodinar, District : Gir Somnath, Gujarat - 362715)

CIN Nos. L26942GJ1981 PLC004717, Website : www.ambujacement.com

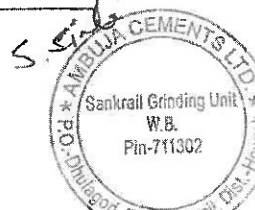
A	Conditions	Status of Compliance
1	This consent is valid for the manufacturing of Various grade cement - 24,00,000 TPA	ACL Sankrail plant produce various grades of Cement which does not exceed the approved quantity (24,00,000 MT) Financial year 2020-21: 20,56,109 MT Financial year 2021-22: 21,84,107 MT
2	The applicant shall remain responsible for quantity and quality of liquid effluent and air emissions.	No industrial waste water is generated as this is a cement grinding unit, which has a dry process plant. Domestic waste water is collected in sewage treatment plant [zero discharge concepts] and recycled and reused to minimize fresh water usage. Present water discharged from STP being used for gardening & dust suppression within plant boundary for which three 20KL tank has been installed to collect the water and further using through water tanker for dust suppression. To Control air emission below the 30 mg / Nm ³ in all process stacks as per MoEF & CC Notification dated 10th May 2016, plant has installed efficient Bag house/bagfilters and being monitored continuously. Summary of Stack monitoring and Ambient Air data of last one years is provided in Annexure-1
3	Daily discharge of industrial liquid effluent shall not exceed ----- KL	Not applicable
4	Daily discharge of domestic liquid effluent shall not exceed 28.0 KL	Plant is not discharging any domestic liquid effluent outside. Plant has its STP to process the domestic effluent and then use the treated water for the dust suppression and greenery.
5	Daily discharge of mixed (industrial & domestic) liquid effluent shall not exceed ----- KL	Not applicable
6	The applicant shall discharge liquid effluent to septic tank-soakpit (place of discharge) through 01 no outlet /outfalls	Being followed.
7	To bring into any altered or new outlet/outfall or to change the place of discharge, the applicant shall have to inform the Board and obtain prior permission of the Board in this effect.	No change has been made. If any such condition arise, prior permission will be taken.
8	The Applicant shall provide comprehensive facility for treatment of industrial liquid waste and domestic liquid waste (sewage, sullage and liquid effluent generated from canteen) and operate and maintain the same continuously so that the quality of final effluent conforms to the standard as given in table-I in page 03. Domestic effluent: PH between 5.5 to 9.0 and TSS not exceed 100 mg/l	Presently treated water discharge from STP [continuously operated and maintained] being used for gardening & dust suppression within plant boundary. This test result [tested in a interval of six months] of the treated water is attached in the Annexure 2. Last analysis report of STP effluent water is as below. PH value 7.86 at 25 deg C and TSS is 42 mg/l
9	The applicant falls in the Red Category of the Water cess act 1977 and rules made thereunder and the Applicant shall comply with the provisions of the said Act and Rules made thereunder.	now it has been abolished by GOI after roll-out of GST(Annexure-5)
10	Daily Water consumption for the following purposes should not exceed a) Industrial cooling, spraying in mine pits and boiler feed water - 20KL b) Domestic purpose - 160 KL	As this is a grinding unit, only water is used in equipment cooling which is used in recirculation process. Only loss is happened due to evaporation. So the quantity of daily consumption remains under 20 KL. For domestic purposes, the daily water consumption is maintained under 160 KL by monitoring its usage through various water meter installed.
11	The Applicant shall install suitable device for measuring the volume of water consumed for different purposes as mentioned above giving correct result to the satisfaction of the State Board.	Complied: Water flow meters have been installed at different locations of water consumption including water withdrawal also for recording water consumption.
12	All the Stacks connected to various sources of emissions must be designated by numbers such as S-1, S-2, S-3 etc and this must be painted / displayed to facilitate identification.	Stacks connected to various sources of emissions are designated by Internal identification numbers such HAC etc and displayed to facilitate locations as per directions given.



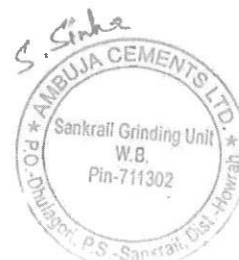
13	The Applicant shall install comprehensive control system consisting of Pollution control equipment as is warranted with reference to generation of air emissions and operate and maintain the same continuously so as to achieve the level of pollutants of the Standard as given in Annexure-I	Plant has installed bag filters as pollution control equipments and operated & maintained continuously to maintain the level of pollutants below the standard limits. We are carrying out the sampling and analysis of all the stacks at an interval of six months as defined in the CTO. Summary of Stack monitoring and Ambient Air data of last one years is provided in Annexure-1
14	The Applicant shall provide ports in the stacks and other necessary permanent facilities such as ladder, platform etc for monitoring / sampling the air emissions and the same shall be made available for inspection and use by the State Board's staff as well as State board's authorised agencies.	All the stacks are having proper sampling ports along with platforms for monitoring / sampling of air emissions.
15	Furnace oil / HSD Consumption quantity is 300 KL/month for DG set operation	DG is rarely operational as plant is mostly using grid power for its operation. In the year 2021 the average consumption of FO in DG is 5 KL/month and diesel is 0.3 KL / month.
16	The Applicant shall maintain the generation and disposal of non-hazardous solid waste as specified below: Metal scrap : 10 MT/ month through sale PP Bag : 8 MT/month through sale	Being followed. For getting the parties for selling non-hazardous waste, plant has to wait for accumulation of some quantity otherwise parties are not showing interest for lifting. However average per month disposal of these non-hazardous wastes remain under the prescribed limit.
17	The Applicant shall take adequate measures for control of noise levels from its own sources within the premises within the limit given below: Day time (06 am to 10 pm) - 65 dB(A) Night time (10 pm to 06 am) - 55 dB(A)	The overall noise level is monitored regularly in and around the plant area. This is within the prescribed limits. PPE are used for more than five minutes exposure. The Cement mill area is curtained with rubber sheets to reduce noise impacts on environment. After installation of Roller Press the noise generation of Cement Mill-1 has also reduced. Proper signages are also fixed at different locations for awareness.
18	The Applicant shall at all times maintain good housekeeping, proper working order and operate efficiently for control of pollution from all sources so as not to cause nuisance to surrounding areas/inhabitants and to achieve compliance with the terms and conditions of the consent	To maintain good housekeeping in plant, we have efficient dedusting & spillage control systems. All material handling and process equipments are fully covered to avoid any nuisance to surrounding areas. We have also mechanised equipments for road sweeping and industrial vacuum cleaning machines, water sprinklers etc. This is a continuous process.
19	The Applicant shall bring about at least 33% of the available open land under the green coverage/plantation.	A proper green belt is developed in our existing factory premises. Out of total existing plant area, 20.9 acre area (34.60 %) has already being developed into green belt.
20	The Applicant shall provide for an alternate electric power sources sufficient to operate all pollution control facilities installed by the Applicant to maintain compliance with the terms and conditions of the consent. In absence of such an alternate electric power source, the Applicant shall stop, reduce or otherwise control production to abide by the terms and conditions of the Consent regarding pollution level.	All pollution measuring devices are connected with UPS. Also devices are interlocked with processes equipments.
21	The Applicant shall install a separate energy meter showing the consumption of energy for operation of pollution control devices.	We have installed energy meters at all critical pollution control devices for getting energy consumption. All our pollution control devices are interlocked with production processes. As we mentioned above that in the condition of failure of running of any pollution control device, the whole process is stopped.
22	The Applicant shall ensure that fugitive emissions from the activity are controlled so as to maintain clean and safe environment in and around the factory premises.	The company has taken adequate measures to control fugitive dust emission. 1. All transfer points and storage silos are provided with dust collection and extraction systems for effective control of fugitive emissions. 2. Clinker is stored inside two no. silos of 25,000 MT each 3. Fly-Ash is stored inside a 4000 MT Silo. Fly Ash is handled through Pneumatic system. 4. Gypsum Stock piles are stored under covered shed. 5. Finished Cement is stored in 4 no. Cement Silos of 5,000 MT. 6. All conveyors are covered with GI sheets to avoid any secondary fugitive dust emission. Improved sealing arrangements in belt conveyors by installing effective side scrappers.
23	The Applicant shall provide drainage system for conveying industrial and domestic liquid waste. Storm water drain shall be kept separate from the drainage system meant for industrial and domestic liquid waste.	This is a cement grinding unit hence there is no generation of industrial liquid waste. Domestic liquid waste is treated at sewage treatment plant for treatment. Also Storm water drain is kept separate.
24	The Applicant shall maintain a separate register showing consumption of chemicals used in pollution control systems.	Plant is not using any chemicals for pollution control systems. There are bag filters used as APC system.



25	The Applicant shall get the samples of hazardous waste/leachates analysed at least once in ____ from the laboratory recognized of the West Bengal Pollution Control Board and ensure that they conform to the limits stipulated. Test reports shall be sent to the Board.	Not mentioned in CTO.
26	The Applicant shall provide adequate and safe facility for collection of air, waste water and solid waste samples by State Board's staff as well as State Board's authorised agencies.	The plant has provided adequate and safe access to collect all the above mentioned samples by the State Board's staff as well as State Board's authorized agencies. All the stacks have safe platform to access properly.
27	The Applicant shall submit to the State Board by the 30th September of every year the Environmental Statement Report for the financial year ending 31st March of the current year in the prescribed form (Form-V) as required under the provisions of rule 14 of the Environment (protection) (second amendment) rules, 1992.	Environment statement is regularly updated to the State board before 30th September of every year. Last year report is attached in Annexure-3.
28	The Applicant shall allow the officers of the State Board to enter into the applicant's premises at any reasonable time to inspect the pollution control systems as well as monitoring and measuring devices in connection with prevention and control of pollution.	Noted and being followed.
29	The Applicant shall maintain an inspection book in the factory premises which shall be made available to officers and employees of the State Board for inspection, review and write down any direction or observation as is deemed necessary during the inspection from time to time.	Inspection register is being maintained properly and officers from State board is used to update the same during their inspection to the plant. Scan copy of the same is attached in Annexure-4.
30	The Applicant shall furnish to the state board all information in respect of quality, quantity, rate of discharge, place of discharge of liquid effluent and air emissions.	We furnish the air emission reports to the State Board regularly. As this is a cement grinding unit [dry process] hence there is no generation of liquid effluent.
31	The Applicant shall maintain adequate number of qualified and trained personnel among his staff for proper maintenance and operation of the effluent treatment and / or emission control devices and for overall environment management of the industry.	We have adequate number of qualified, competent and trained personnel for maintenance and operations of emission control devices. There is no effluent treatment plant as this is a cement grinding unit.
32	The Applicant shall have to make registration for the use of ground water if any, with Central Ground Water Authority.	Permission obtained from Ground Water Resource Development Authority, Govt. of West Bengal. Permit No. P060900201074000000ITLE dt. 21.06.2011 & P060900201963000000ITSE dt. 13/02/2012 for 180 m3/day & 90 m3/day drawn of ground water through borewells. The same has been updated regularly in six monthly compliance.
33	The Applicant shall intimate to the State Board immediately of any occurrence of discharge of any poisonous, noxious or pollutants in excess of quality as well as quality as mentioned earlier to any receiving water body/ receiving system or to atmosphere owing to accident or other unforeseen incident/event including natural disaster. The Applicant Shall (i) take all steps adequate to prevent such accident discharge / release of poisonous, noxious or pollutants and to limit their consequences to persons and the environment , (ii) provide to the persons working on the site with the information, training and equipment including antidotes necessary to ensure their safety and mitigate the accidental release of poisonous noxious or pollutants to the environment.	Since it is a cement grinding unit no gaseous emission occurred during process.
34	The Applicant shall make an application to the State Board in the prescribed form for renewal of the consent at least 60 days before the date of expiry of this consent.	Noted.
35	The Applicant shall not make any alteration . Modification / expansion in the existing manufacturing process and equipment as well as the pollution control system without prior approval of the board.	No alteration/ modification/ expansion will be taken in the existing manufacturing process and equipment as well as the pollution control system without prior approval of the board.
36	The Applicant shall comply with the conditions as laid down in the Manufacture, Storage and Import of hazardous chemicals Rules 1989 and Hazardous Wastes Rules, 1989.	The same is being complied and regularly updated in hazardous waste return. Also plant is regularly updating the State Board regarding the disposal of hazardous waste to the State board through sending the Form-10 (hazardous waste manifest).
A	Additional Conditions	



1	The unit should strictly abide by the condition as stipulated in the Environmental Clearance issued by MOEF, G.O.J vide no.J-11011/547/2010.1A.11(1) dated 23/06/2011 & NOC issued by the State Board vide memo no.453-2N-69/2007(E) dated 02/08/2011 , Memo No.13 I-2N-69/2007 (E) dated 19/02/2015 & memo no.953-2N-69/2007(E) dated 29.08.2019.	We have complied with the conditions as given in the Environment Clearance issued by MOEF &CC and NOC issued by the State Board. Compliance reports is being submitted every six months to MOEF and State Board respectively.
2	The unit shall abide by emission standards stipulated in the Notification issued by MOEF&CC, G.O.1 vide no.G.S.R.497(E) dated 10/05/2016.	Noted & Complied.
3	The unit should obtain all the statutory licenses as applicable from other concerned Govt. Department.	Noted & Complied.
4	No addition / alteration/modification/expansion is allowed without prior approval of the Board.	Noted.
5	Continuous monitoring system for all the stacks must be maintained.	Noted & Complied as continuous monitoring system have been installed for 11 stacks and calibrated regularly
6	The unit should adopt rain water harvesting system and submit the proposal of the same at the earliest.	Noted. The same has been completed at residential colony and another RWHS is in under process for packing plant roof top.
7	The unit should take and maintain necessary control measure for controlling fugitive emission and monitor the parameters in the strategic location to keep the ambient free from Suspended Particulate Matter.	We have installed efficient pollution control systems at all transfer points, storages, process equipments, all material handling is fully covered. For fugitive emission control on ground - we have Industrial Vacuum Road Sweeping machines (02 nos), Small road sweeping machines (02 nos) and Water sprinklers. We also measure and monitor fugitive emission at 8 locations. we also do continuous improvement.
8	This consent may be revoked at any time on violation of environmental norms/direction and/or on the ground of any valid complaint against the unit from environmental point of view.	Noted.



Annexure-1

Stack Gas Report



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR

9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380 / 3381 / 3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



NABL ACCREDITED
LABORATORY
Certificate No. TC-7815

TEST REPORT

No. AP-FG/21-22/444

Date: September 16, 2021

Page 1 of 1

Issued to : M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)
Address : Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.

Your Ref. PO No. : 2800852844/NE13 dtd. 20.07.2021

Sample Description : Stack Gas

Date & time of sampling : 02.09.2021 at 12:30 P.M. to 01:00 P.M.

Test Completed on : 15.09.2021

Parameters Tested

Physical : Temp., Velocity, Gas flow

Chemical : CO, CO₂ & PM

A. General information about stack :

1. Stack connected to : Roller Press
2. Emission due to : Cement Grinding
3. Material of construction of stack : M.S
4. Shape of stack : Circular
5. Whether stack is provided with permanent platform & ladder : Yes

B. Physical characteristics of stack :

1. Height of the stack (a) from ground level : 71.5 M (b) from roof level : ---
2. Diameter of the stack (a) at bottom : --- (b) at top : 1.5 M
3. Diameter of the stack at sampling point : 1.5 M
4. No. of Traverse point : 12 Nos.
5. Height of the sampling point from GL : 36.0 M

C. Analysis / Characteristic of stack :

1. Fuel used : Nil

2. Fuel consumption : Nil

D. Results of Physical Parameters of Flue Gas :

Barometric pressure : 754 mmHg.

Volume of Gas Sample : 1170 Litre

Sl No	Test Parameters	Test Method	Unit	Results
1.	Temperature of emission	IS 11255 : Part 3 : 2008	°C	82
2.	Velocity of gas in duct	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	m/sec	10.08
3.	Quantity of gas flow	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	NM ³ /hr	50173

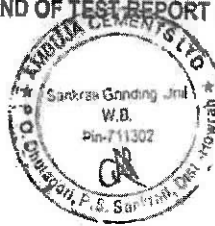
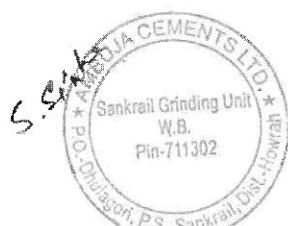
E. Results of gaseous emission :

1.	Carbon monoxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	<0.2	Not Available
2.	Carbon dioxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	0.3	Not Available
3.	Particulate Matters	IS 11255 : Part 1 : 1985 RA 2009	mg/Nm ³	23	30 max.

F. Pollution control device

Details of pollution control devices attached with the stack : Bag Filter.

END OF TEST REPORT :



(J. MUKHERJEE)
Quality Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

- * The test report shall not be reproduced, except in full, without written approval of the Company.
- * Results relate only to the parameters tested.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR
9, BENTINCK STREET, KOLKATA - 700 001
Phone : (033) 4044-3380/3381/3382 / 3383, Fax : 33 2248-0447
E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com
CIN : U51109WB1931PTC007007



TEST REPORT

No. AP-FG/21-22/996A

Date: January 27, 2022

Page 1 of 1

Issued to : M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)					
Address : Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.					
Sample Description : Stack Gas	Parameters Tested				
Date & time of sampling : 24.01.2022 at 10:30 A.M. to 11:05 A.M.	Physical : Temp., Velocity, Gas flow				
Test Completed on : 27.01.2022	Chemical : SO ₂ , NO ₂ , CO, CO ₂ & PM				
A. General information about stack :					
1. Stack connected to	: DG - I				
2. Emission due to	: Burning of Furnace Oil				
3. Material of construction of stack	: M.S.				
4. Shape of stack	: Circular.				
5. Whether stack is provided with permanent platform & ladder	: Yes				
6. Generator capacity	: 6 MW				
B. Physical characteristics of stack :					
1. Height of the stack (a) from ground level : 60.0 M	(b) from roof level : ---				
2. Diameter of the stack (a) at bottom : ---	(b) at top : 1.0 M				
3. Diameter of the stack at sampling point	: 1.0 M				
4. No. of Traverse point	: 12 Nos.				
5. Height of the sampling point from GL	: 30.0 M				
C. Analysis / Characteristic of stack :					
1. Fuel used : Furnace Oil	2. Fuel consumption : 1100 Lt./hr.				
D. Results of Physical Parameters of Flue Gas :					
Barometric pressure : 756 mmHg.					
Volume of Gas Sample : 1039 Litre					
SI No	Test Parameters	Test Method	Unit	Results	
1.	Temperature of emission	IS 11255 : Part 3 : 2008	°C	210	
2.	Velocity of gas in duct	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	m/sec	10.05	
3.	Quantity of gas flow	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	NM ³ /hr	17467	
E. Results of gaseous emission :					
SI No	Test Parameters	Test Method	Unit	Results	Norms as per CPCB
4.	Sulphur dioxide	IS 11255 : Part 2 : 1985 RA 2012	mg/Nm ³	123.0	Not Available
5.	Nitrogen dioxide	IS 11255 : Part 7 : 2005 RA 2012	mg/Nm ³	154.0	Not Available
6.	Carbon monoxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	<0.2	Not Available
7.	Carbon dioxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	7.4	Not Available
8.	Particulate Matters	IS 11255 : Part 1 : 1985 RA 2009	mg/Nm ³	88	150 max.
E. Pollution control device					
Details of pollution control devices attached with the stack : Nil.					

S. Mondal
Report Verified By
S. Mondal

: END OF TEST REPORT :-



(J. MUKHERJEE)
Quality Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR
9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380/3381/3382 / 3383, Fax : 33 2248-0447
E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com
CIN : U51109WB1931PTC007007



TC-7815

TEST REPORT

No. AP-FG/21-22/997A		Date: January 27, 2022		Page 1 of 1	
Issued to		: M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)			
Address		: Jaiadhulagori, VIII & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.			
Sample Description		: Stack Gas		<u>Parameters Tested</u>	
Date & time of sampling		: 24.01.2022 at 11:20 A.M. to 11:55 A.M.		Physical : Temp., Velocity, Gas flow	
Test Completed on		: 27.01.2022		Chemical : SO ₂ , NO ₂ , CO, CO ₂ & PM	
A. General Information about stack :					
1. Stack connected to		: DG - II			
2. Emission due to		: Burning of Furnace Oil			
3. Material of construction of stack		: M.S.			
4. Shape of stack		: Circular.			
5. Whether stack is provided with permanent platform & ladder		: Yes			
6. Generator capacity		: 4 MW			
B. Physical characteristics of stack :					
1. Height of the stack		(a) from ground level : 60.0 M		(b) from roof level : ---	
2. Diameter of the stack		(a) at bottom : ---		(b) at top : 1.0 M	
3. Diameter of the stack at sampling point		: 1.0 M			
4. No. of Traverse point		: 12 Nos.			
5. Height of the sampling point from GL		: 30.0 M			
C. Analysis / Characteristic of stack :					
1. Fuel used : Furnace Oil		2. Fuel consumption : 900 Lt./hr.			
D. Results of Physical Parameters of Flue Gas :					
Barometric pressure : 756 mmHg.					
Volume of Gas Sample : 1035 Litre					
Sl No	Test Parameters	Test Method	Unit	Results	
1.	Temperature of emission	IS 11255 : Part 3 : 2008	°C	214	
2.	Velocity of gas in duct	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	m/sec	10.07	
3.	Quantity of gas flow	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	NM ³ /hr	17351	
E. Results of gaseous emission :					
Sl No	Test Parameters	Test Method	Unit	Results	Norms as per CPCII
4.	Sulphur dioxide	IS 11255 : Part 2 : 1985 RA 2012	mg/Nm ³	129.0	Not Available
5.	Nitrogen dioxide	IS 11255 : Part 7 : 2005 RA 2012	mg/Nm ³	162.0	Not Available
6.	Carbon monoxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	<0.2	Not Available
7.	Carbon dioxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	7.2	Not Available
8.	Particulate Matters	IS 11255 : Part 1 : 1985 RA 2009	mg/Nm ³	80	150 max.
E. Pollution control device					
Details of pollution control devices attached with the stack : Nil.					

S. Mondal
Report Verified By
S. Mondal

:- END OF TEST REPORT :-

(J. MUKHERJEE)
Quality Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.





R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR
9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380/3381/3382 / 3383, Fax : 33 2248-0447
E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com
CIN : U51109WB1931PTC007007



TC-7815

TEST REPORT

No. AP-FG/21-22/998A

Date: January 27, 2022

Page 1 of

Issued to : M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)					
Address : Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.					
Sample Description : Stack Gas	Parameters Tested				
Date & time of sampling : 24.01.2022 at 12:10 P.M. to 12:45 P.M.	Physical : Temp., Velocity, Gas flow				
Test Completed on : 27.01.2022	Chemical : SO ₂ , NO ₂ , CO, CO ₂ & PM				
A. General information about stack :					
1. Stack connected to : DG - III					
2. Emission due to : Burning of H.S.D					
3. Material of construction of stack : M.S.					
4. Shape of stack : Circular.					
5. Whether stack is provided with permanent platform & ladder : Yes					
6. Generator capacity : 1 MW					
B. Physical characteristics of stack :					
1. Height of the stack (a) from ground level : 60.0 M (b) from roof level : ---					
2. Diameter of the stack (a) at bottom : --- (b) at top : 1.0 M					
3. Diameter of the stack at sampling point : 1.0 M					
4. No. of Traverse point : 12 Nos.					
5. Height of the sampling point from GL : 30.0 M					
C. Analysis / Characteristic of stack :					
1. Fuel used : H.S.D 2. Fuel consumption : 900 Lt./hr.					
D. Results of Physical Parameters of Flue Gas :					
Barometric pressure : 756 mmHg.					
Volume of Gas Sample : 1063 Litre					
Sl No	Test Parameters	Test Method	Unit	Results	
1.	Temperature of emission	IS 11255 : Part 3 : 2008	°C	205	
2.	Velocity of gas in duct	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	m/sec	10.14	
3.	Quantity of gas flow	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	NM ³ /hr	17811	
E. Results of gaseous emission :					
Sl No	Test Parameters	Test Method	Unit	Results	Norms as per CPCII
4.	Sulphur dioxide	IS 11255 : Part 2 : 1985 RA 2012	mg/Nm ³	122.0	Not Availabl
5.	Nitrogen dioxide	IS 11255 : Part 7 : 2005 RA 2012	mg/Nm ³	169.0	Not Availabl
6.	Carbon monoxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	<0.2	Not Availabl
7.	Carbon dioxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	7.6	Not Availabl
8.	Particulate Matters	IS 11255 : Part 1 : 1985 RA 2009	mg/Nm ³	74	150 max.
E. Pollution control device					
Details of pollution control devices attached with the stack : Nil.					

S. Mondal
Report Verified By
S. Mondal

:- END OF TEST REPORT :-

J. MUKHERJEE
Quality Manager

Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.





R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR
9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380/3381/3382 / 3383, Fax : 33 2248-0447
E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com
CIN : U51109WB1931PTC007007



TC-7815

TEST REPORT

No. AP-FG/21-22/886

Date: January 13, 2022

Page 1 of 1

Issued to : M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)					
Address : Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.					
Your Ref. PO No. : 2800852844/NE13 dtd. 20.07.2021	Parameters Tested				
Sample Description : Stack Gas	Physical : Temp., Velocity, Gas flow				
Date & time of sampling : 07.01.2022 at 12:15 P.M. to 01:03 P.M.	Chemical : CO, CO ₂ & PM				
Test Completed on : 13.01.2022					
A. General information about stack :					
1. Stack connected to : Wagon Tippler					
2. Emission due to : Material transfer.					
3. Material of construction of stack : M.S.					
4. Shape of stack : Circular.					
5. Whether stack is provided with permanent platform & ladder : Yes					
B. Physical characteristics of stack :					
1. Height of the stack (a) from ground level : 28.0 M (Approx) (b) from roof level : ---					
2. Diameter of the stack (a) at bottom : --- (b) at top : 2.10 M					
3. Diameter of the stack at sampling point : 2.10 M					
4. No. of Traverse point : 24 Nos.					
5. Height of the sampling point from GL : ---					
C. Analysis / Characteristic of stack :					
1. Fuel used : Nil					
2. Fuel consumption : Nil					
D. Results of Physical Parameters of Flue Gas :					
Barometric pressure : 762 mmHg.					
Volume of Gas Sample : 1056 Litre					
Sl No	Test Parameters	Test Method	Unit	Results	
1.	Temperature of emission	IS 11255 : Part 3 : 2008	°C	32	
2.	Velocity of gas in duct	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	m/sec	11.16	
3.	Quantity of gas flow	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	NM ³ /hr	131865	
E. Results of gaseous emission :					
Sl No	Test Parameters	Test Method	Unit	Results	Norms as per CPCB
1.	Carbon monoxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	<0.2	Not Available
2.	Carbon dioxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	0.5	Not Available
3.	Particulate Matters	IS 11255 : Part 1 : 1985 RA 2009	mg/Nm ³	<10 (09)	30 max.
F. Pollution control device					
Details of pollution control devices attached with the stack : Bag Filter.					

Report Verified by
(S. Mondal)



:- END OF TEST REPORT :-

(J. MUKHERJEE)
Quality Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

- * The test report shall not be reproduced, except in full, without written approval of the Company.
- * Results relate only to the parameters tested.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR
9, BENTINCK STREET, KOLKATA - 700 001
Phone : (033) 4044-3380/3381/3382 / 3383, Fax : 33 2248-0447
E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com
CIN : U51109WB1931PTC007007



TC-7815

TEST REPORT

No. AP-FG/21-22/885

Date: January 13, 2022

Page 1 of 1

Issued to : M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)					
Address : Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.					
Your Ref. PO No. : 2800852844/NE13 dtd. 20.07.2021	Parameters Tested				
Sample Description : Stack Gas	Physical : Temp., Velocity, Gas flow				
Date & time of sampling : 06.01.2022 at 02:30 P.M. to 03:18 P.M.	Chemical : CO, CO ₂ & PM				
Test Completed on : 13.01.2022					
A. General information about stack :					
1. Stack connected to : Packer - 4					
2. Emission due to : Cement Packing					
3. Material of construction of stack : M.S					
4. Shape of stack : Circular.					
5. Whether stack is provided with permanent platform & ladder : Sample was taken from roof top.					
B. Physical characteristics of stack :					
1. Height of the stack (a) from ground level : 36.5 M (b) from roof level : ---					
2. Diameter of the stack (a) at bottom : --- (b) at top : 1.1 M					
3. Diameter of the stack at sampling point : 1.1 M					
4. No. of Traverse point : 12 Nos.					
5. Height of the sampling point from GL : 35.5 M					
C. Analysis / Characteristic of stack :					
1. Fuel used : Nil					
2. Fuel consumption : Nil					
D. Results of Physical Parameters of Flue Gas :					
Barometric pressure : 762 mmHg.					
Volume of Gas Sample : 1008 Litre					
Sl No	Test Parameters	Test Method	Unit	Results	
1.	Temperature of emission	IS 11255 : Part 3 : 2008	°C	30	
2.	Velocity of gas in duct	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	m/sec	10.44	
3.	Quantity of gas flow	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	NM ³ /hr	34253	
E. Results of gaseous emission :					
Sl No	Test Parameters	Test Method	Unit	Results	Norms as per CPCB
1.	Carbon monoxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	<0.2	Not Available
2.	Carbon dioxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	0.4	Not Available
3.	Particulate Matters	IS 11255 : Part 1 : 1985 RA 2009	mg/Nm ³	27	30 max.
F. Pollution control device					
Details of pollution control devices attached with the stack : Bag Filter.					

:- END OF TEST REPORT :-

Report Verified by
(S. Mondal)



(J. MUKHERJEE)
Quality Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

88

- * The test report shall not be reproduced, except in full, without written approval of the Company.
- * Results relate only to the parameters tested.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR
9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380/3381/3382 / 3383, Fax : 33 2248-0447
E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com
CIN : U51109WB1931PTC007007



TC-7815

TEST REPORT

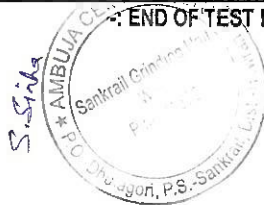
No. AP-FG/21-22/884

Date: January 13, 2022

Page 1 of 1

Issued to : M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)					
Address : Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.					
Your Ref. PO No. : 2800852844/NE13 dtd. 20.07.2021	Parameters Tested				
Sample Description : Stack Gas	Physical : Temp., Velocity, Gas flow				
Date & time of sampling : 05.01.2022 at 03:40 P.M. to 04:28 P.M.	Chemical : CO, CO ₂ & PM				
Test Completed on : 13.01.2022					
A. General information about stack :					
1. Stack connected to : Packer - 3					
2. Emission due to : Cement Packing					
3. Material of construction of stack : M.S					
4. Shape of stack : Circular.					
5. Whether stack is provided with permanent platform & ladder : Sample was taken from roof top.					
B. Physical characteristics of stack :					
1. Height of the stack (a) from ground level : 36.5 M (b) from roof level : ---					
2. Diameter of the stack (a) at bottom : --- (b) at top : 1.1 M					
3. Diameter of the stack at sampling point : 1.1 M					
4. No. of Traverse point : 12 Nos.					
5. Height of the sampling point from GL : 34.5 M					
C. Analysis / Characteristic of stack :					
1. Fuel used : Nil					
2. Fuel consumption : Nil					
D. Results of Physical Parameters of Flue Gas :					
Barometric pressure : 762 mmHg.					
Volume of Gas Sample : 1056 Litre					
Sl No	Test Parameters	Test Method	Unit	Results	
1.	Temperature of emission	IS 11255 : Part 3 : 2008	°C	30	
2.	Velocity of gas in duct	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	m/sec	11.09	
3.	Quantity of gas flow	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	NM ³ /hr	36313	
E. Results of gaseous emission :					
Sl No	Test Parameters	Test Method	Unit	Results	Norms as per CPCB
1.	Carbon monoxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	<0.2	Not Available
2.	Carbon dioxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	0.3	Not Available
3.	Particulate Matters	IS 11255 : Part 1 : 1985 RA 2009	mg/Nm ³	23	30 max.
F. Pollution control device					
Details of pollution control devices attached with the stack : Bag Filter.					

Report Verified by
(S. Mondal)



(J. MUKHERJEE)
Quality Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

68

- * The test report shall not be reproduced, except in full, without written approval of the Company.
- * Results relate only to the parameters tested.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR
9, BENTINCK STREET, KOLKATA - 700 001
Phone : (033) 4044-3380/3381/3382 / 3383, Fax : 33 2248-0447
E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com
CIN : U51109WB1931PTC007007



TC-7815

TEST REPORT

No. AP-FG/21-22/883

Date: January 13, 2022

Page 1 of 1

Issued to : M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)					
Address : Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.					
Your Ref. PO No. : 2800852844/NE13 dtd. 20.07.2021	Parameters Tested				
Sample Description : Stack Gas	Physical : Temp., Velocity, Gas flow				
Date & time of sampling : 05.01.2022 at 02:45 P.M. to 03:23 P.M.	Chemical : CO, CO ₂ & PM				
Test Completed on : 13.01.2022					
A. General information about stack :					
1. Stack connected to	: Packer - 2				
2. Emission due to	: Cement Packing				
3. Material of construction of stack	: M.S				
4. Shape of stack	: Circular.				
5. Whether stack is provided with permanent platform & ladder	: Yes				
B. Physical characteristics of stack :					
1. Height of the stack (a) from ground level : 30.0 M	(b) from roof level : ---				
2. Diameter of the stack (a) at bottom : ---	(b) at top : 1.0 M				
3. Diameter of the stack at sampling point	: 1.0 M				
4. No. of Traverse point	: 12 Nos.				
5. Height of the sampling point from GL	: 21.0 M				
C. Analysis / Characteristic of stack :					
1. Fuel used : Nil	2. Fuel consumption : Nil				
D. Results of Physical Parameters of Flue Gas :					
Barometric pressure : 762 mmHg.					
Volume of Gas Sample : 1104 Litre					
Sl No	Test Parameters	Test Method	Unit	Results	
1.	Temperature of emission	IS 11255 : Part 3 : 2008	°C	33	
2.	Velocity of gas in duct	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	m/sec	11.63	
3.	Quantity of gas flow	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	NM ³ /hr	31159	
E. Results of gaseous emission :					
Sl No	Test Parameters	Test Method	Unit	Results	Norms as per CPCB
1.	Carbon monoxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	<0.2	Not Available
2.	Carbon dioxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	0.3	Not Available
3.	Particulate Matters	IS 11255 : Part 1 : 1985 RA 2009	mg/Nm ³	<10 (04)	30 max.
F. Pollution control device					
Details of pollution control devices attached with the stack : Bag Filter.					

Report Verified by
(S. Mondal)

:- END OF TEST REPORT :-



(J. MUKHERJEE)
Quality Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

- * The test report shall not be reproduced, except in full, without written approval of the Company.
- * Results relate only to the parameters tested.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR

9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380/3381/3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



TC-7815

TEST REPORT

No. AP-FG/21-22/882

Date: January 13, 2022

Page 1 of 1

Issued to : M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)					
Address : Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.					
Your Ref. PO No. : 2800852844/NE13 dtd. 20.07.2021	Parameters Tested				
Sample Description : Stack Gas	Physical : Temp., Velocity, Gas flow				
Date & time of sampling : 05.01.2022 at 02:00 P.M. to 02:42 P.M.	Chemical : CO, CO ₂ & PM				
Test Completed on : 13.01.2022					
A. General information about stack :					
1. Stack connected to : Packer - 1					
2. Emission due to : Cement Packing					
3. Material of construction of stack : M.S					
4. Shape of stack : Circular					
5. Whether stack is provided with permanent platform & ladder : Yes					
B. Physical characteristics of stack :					
1. Height of the stack (a) from ground level : 30.0 M (b) from roof level : ---					
2. Diameter of the stack (a) at bottom : --- (b) at top : 1.0 M					
3. Diameter of the stack at sampling point : 1.0 M					
4. No. of Traverse point : 12 Nos.					
5. Height of the sampling point from GL : 21.0 M					
C. Analysis / Characteristic of stack :					
1. Fuel used : Nil 2. Fuel consumption : Nil					
D. Results of Physical Parameters of Flue Gas :					
Barometric pressure : 762 mmHg.					
Volume of Gas Sample : 1008 Litre					
Sl No	Test Parameters	Test Method	Unit	Results	
1.	Temperature of emission	IS 11255 : Part 3 : 2008	°C	36	
2.	Velocity of gas in duct	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	m/sec	12.28	
3.	Quantity of gas flow	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	NM ³ /hr	32503	
E. Results of gaseous emission :					
Sl No	Test Parameters	Test Method	Unit	Results	Norms as per CPCB
1.	Carbon monoxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	<0.2	Not Available
2.	Carbon dioxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	0.4	Not Available
3.	Particulate Matters	IS 11255 : Part 1 : 1985 RA 2009	mg/Nm ³	28	30 max.
F. Pollution control device					
Details of pollution control devices attached with the stack : Bag Filter.					

Report Verified by
(S. Mondal)

:- END OF TEST REPORT :-



(J. MUKHERJEE)
Quality Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

- * The test report shall not be reproduced, except in full, without written approval of the Company.
- * Results relate only to the parameters tested.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR
9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380/3381/3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



TC-7815

TEST REPORT

No. AP-FG/21-22/887

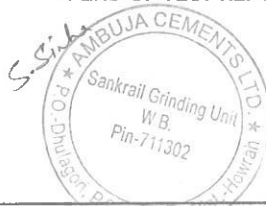
Date: January 13, 2022

Page 1 of 1

Issued to : M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)					
Address : Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.					
Your Ref. PO No. : 2800852844/NE13 dtd. 20.07.2021	Parameters Tested				
Sample Description : Stack Gas	Physical : Temp., Velocity, Gas flow				
Date & time of sampling : 05.01.2022 at 12:00 P.M. to 12:30 P.M.	Chemical : CO, CO ₂ & PM				
Test Completed on : 13.01.2022					
A. General information about stack :					
1. Stack connected to	: Roller Press				
2. Emission due to	: Cement Grinding				
3. Material of construction of stack	: M.S				
4. Shape of stack	: Circular				
5. Whether stack is provided with permanent platform & ladder	: Yes				
B. Physical characteristics of stack :					
1. Height of the stack (a) from ground level : 71.5 M	(b) from roof level : ---				
2. Diameter of the stack (a) at bottom : ---	(b) at top : 1.5 M				
3. Diameter of the stack at sampling point	: 1.5 M				
4. No. of Traverse point	: 12 Nos.				
5. Height of the sampling point from GL	: 36.0 M				
C. Analysis / Characteristic of stack :					
1. Fuel used : Nil	2. Fuel consumption : Nil				
D. Results of Physical Parameters of Flue Gas :					
Barometric pressure : 762 mmHg.					
Volume of Gas Sample : 1170 Litre					
Sl No	Test Parameters	Test Method	Unit	Results	
1.	Temperature of emission	IS 11255 : Part 3 : 2008	°C	60	
2.	Velocity of gas in duct	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	m/sec	9.51	
3.	Quantity of gas flow	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	NM ³ /hr	52580	
E. Results of gaseous emission :					
Sl No	Test Parameters	Test Method	Unit	Results	Norms as per CPCB
1.	Carbon monoxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	<0.2	Not Available
2.	Carbon dioxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	0.2	Not Available
3.	Particulate Matters	IS 11255 : Part 1 : 1985 RA 2009	mg/Nm ³	<10 (06)	30 max.
F. Pollution control device					
Details of pollution control devices attached with the stack : Bag Filter.					

Report Verified by
(S. Mondal)

:- END OF TEST REPORT :-



(J. MUKHERJEE)
Quality Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

BB

- * The test report shall not be reproduced, except in full, without written approval of the Company.
- * Results relate only to the parameters tested.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR

9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380/3381/3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



TC-7815

TEST REPORT

No. AP-FG/21-22/893

Date: January 13, 2022

Page 1 of 1

Issued to : M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)					
Address : Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.					
Your Ref. PO No. : 2800852844/NE13 dtd. 20.07.2021	Parameters Tested				
Sample Description : Stack Gas	Physical : Temp., Velocity, Gas flow				
Date & time of sampling : 04.01.2022 at 02:35 P.M. to 03:11 P.M.	Chemical : CO, CO ₂ & PM				
Test Completed on : 13.01.2022					
A. General information about stack :					
1. Stack connected to : Cement Mill No.-2 (Mill Venting)					
2. Emission due to : Cement Grinding					
3. Material of construction of stack : M.S					
4. Shape of stack : Circular					
5. Whether stack is provided with permanent platform & ladder : Yes					
B. Physical characteristics of stack :					
1. Height of the stack (a) from ground level : 32.0 M (b) from roof level : ---					
2. Diameter of the stack (a) at bottom : --- (b) at top : 1.05 M					
3. Diameter of the stack at sampling point : 1.05 M					
4. No. of Traverse point : 12 Nos.					
5. Height of the sampling point from GL : 22.6 M					
C. Analysis / Characteristic of stack :					
1. Fuel used : Nil 2. Fuel consumption : Nil					
D. Results of Physical Parameters of Flue Gas :					
Barometric pressure : 760 mmHg.					
Volume of Gas Sample : 1188 Litre					
Sl No	Test Parameters	Test Method	Unit	Results	
1.	Temperature of emission	IS 11255 : Part 3 : 2008	°C	75	
2.	Velocity of gas in duct	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	m/sec	8.31	
3.	Quantity of gas flow	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	NM ³ /hr	21483	
E. Results of gaseous emission :					
Sl No	Test Parameters	Test Method	Unit	Results	Norms as per CPCB
1.	Carbon monoxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	<0.2	Not Available
2.	Carbon dioxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	0.4	Not Available
3.	Particulate Matters	IS 11255 : Part 1 : 1985 RA 2009	mg/Nm ³	13	30 max.
F. Pollution control device					
Details of pollution control devices attached with the stack : Bag Filter.					

-: END OF TEST REPORT :-

Report Verified by
(S. Mondal)



(J. MUKHERJEE)
Quality Manager

Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

- * The test report shall not be reproduced, except in full, without written approval of the Company.
- * Results relate only to the parameters tested.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR

9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380/3381/3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



TC-7815

TEST REPORT

No. AP-FG/21-22/889

Date: January 13, 2022

Page 1 of 1

Issued to	: M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)				
Address	: Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.				
Your Ref. PO No.	: 2800852844/NE13 dtd. 20.07.2021		<u>Parameters Tested</u> Physical : Temp., Velocity, Gas flow Chemical : CO, CO ₂ & PM		
Sample Description	: Stack Gas				
Date & time of sampling	: 04.01.2022 at 12:00 P.M. to 12:36 P.M.				
Test Completed on	: 13.01.2022				
A. General information about stack :					
1. Stack connected to	: Cement Mill No.-I (Mill Venting)				
2. Emission due to	: Cement Grinding				
3. Material of construction of stack	: M.S				
4. Shape of stack	: Circular				
5. Whether stack is provided with permanent platform & ladder	: Yes				
B. Physical characteristics of stack :					
1. Height of the stack	(a) from ground level : 32.0 M	(b) from roof level : ---			
2. Diameter of the stack	(a) at bottom : ---	(b) at top : 1.05 M			
3. Diameter of the stack at sampling point	: 1.05 M				
4. No. of Traverse point	: 12 Nos.				
5. Height of the sampling point from GL	: 22.6 M				
C. Analysis / Characteristic of stack :					
1. Fuel used	: Nil				
2. Fuel consumption	: Nil				
D. Results of Physical Parameters of Flue Gas :					
Barometric pressure : 760 mmHg.					
Volume of Gas Sample : 1116 Litre					
Sl No	Test Parameters	Test Method	Unit	Results	
1.	Temperature of emission	IS 11255 : Part 3 : 2008	°C	52	
2.	Velocity of gas in duct	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	m/sec	7.26	
3.	Quantity of gas flow	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	NM ³ /hr	20103	
E. Results of gaseous emission :					
Sl No	Test Parameters	Test Method	Unit	Results	Norms as per CPCB
1.	Carbon monoxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	<0.2	Not Available
2.	Carbon dioxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	0.2	Not Available
3.	Particulate Matters	IS 11255 : Part 1 : 1985 RA 2009	mg/Nm ³	<10 (03)	30 max.
F. Pollution control device					
Details of pollution control devices attached with the stack : Bag Filter.					

Report Verified by
(S. Mondal)



END OF TEST REPORT :-

(J. MUKHERJEE)

Quality Manager

Authorised Signatory

For R.V.BRIGGS & CO. (P) LTD.

66

- * The test report shall not be reproduced, except in full, without written approval of the Company.
- * Results relate only to the parameters tested.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR

9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380/3381/3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



TC-7815

TEST REPORT

No. AP-FG/21-22/888

Date: January 13, 2022

Page 1 of 1

Issued to : M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)					
Address : Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.					
Your Ref. PO No. : 2800852844/NE13 dtd. 20.07.2021	Parameters Tested				
Sample Description : Stack Gas	Physical : Temp., Velocity, Gas flow				
Date & time of sampling : 04.01.2022 at 02:10 P.M. to 02:38 P.M.	Chemical : CO, CO ₂ & PM				
Test Completed on : 13.01.2022					
A. General information about stack :					
1. Stack connected to : Cement Mill No.-1 (Hopper)					
2. Emission due to : Material Transferring					
3. Material of construction of stack : M.S					
4. Shape of stack : Circular					
5. Whether stack is provided with permanent platform & ladder : Yes					
B. Physical characteristics of stack :					
1. Height of the stack (a) from ground level : 30.0 M (b) from roof level : ---					
2. Diameter of the stack (a) at bottom : --- (b) at top : 0.60 M					
3. Diameter of the stack at sampling point : 0.60 M					
4. No. of Traverse point : 8 Nos.					
5. Height of the sampling point from GL : 22.2 M					
C. Analysis / Characteristic of stack :					
1. Fuel used : Nil 2. Fuel consumption : Nil					
D. Results of Physical Parameters of Flue Gas :					
Barometric pressure : 760 mmHg.					
Volume of Gas Sample : 1036 Litre					
Sl No	Test Parameters	Test Method	Unit	Results	
1.	Temperature of emission	IS 11255 : Part 3 : 2008	°C	33	
2.	Velocity of gas in duct	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	m/sec	18.73	
3.	Quantity of gas flow	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	NM ³ /hr	18057	
E. Results of gaseous emission :					
Sl No	Test Parameters	Test Method	Unit	Results	Norms as per CPCB
1.	Carbon monoxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	<0.2	Not Available
2.	Carbon dioxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	0.4	Not Available
3.	Particulate Matters	IS 11255 : Part 1 : 1985 RA 2009	mg/Nm ³	<10 (08)	30 max.
F. Pollution control device					
Details of pollution control devices attached with the stack : Bag Filter.					

Report Verified by
(S. Mondal)



:- END OF TEST REPORT :-

(J. MUKHERJEE)
Quality Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

- * The test report shall not be reproduced, except in full, without written approval of the Company.
- * Results relate only to the parameters tested.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR
9, BENTINCK STREET, KOLKATA - 700 001
Phone : (033) 4044-3380/3381/3382 / 3383, Fax : 33 2248-0447
E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com
CIN : U51109WB1931PTC007007



TC-7815

TEST REPORT

No. AP-FG/21-22/891

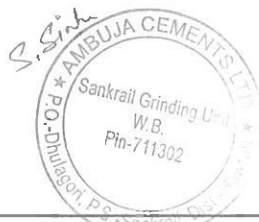
Date: January 13, 2022

Page 1 of 1

Issued to : M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)					
Address : Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.					
Your Ref. PO No. : 2800852844/NE13 dtd. 20.07.2021	Parameters Tested Physical : Temp., Velocity, Gas flow Chemical : CO, CO ₂ & PM				
Sample Description : Stack Gas					
Date & time of sampling : 01.01.2022 at 03:30 P.M. to 03:58 P.M.					
Test Completed on : 13.01.2022					
A. General information about stack :					
1. Stack connected to : Cement Mill No.-2 (Hopper)					
2. Emission due to : Material Transferring					
3. Material of construction of stack : M.S					
4. Shape of stack : Circular					
5. Whether stack is provided with permanent platform & ladder : Yes					
B. Physical characteristics of stack :					
1. Height of the stack (a) from ground level : 30.0 M (b) from roof level : ---					
2. Diameter of the stack (a) at bottom : --- (b) at top : 0.60 M					
3. Diameter of the stack at sampling point : 0.60 M					
4. No. of Traverse point : 8 Nos.					
5. Height of the sampling point from GL : 22.2 M					
C. Analysis / Characteristic of stack :					
1. Fuel used : Nil					
2. Fuel consumption : Nil					
D. Results of Physical Parameters of Flue Gas :					
Barometric pressure : 760 mmHg.					
Volume of Gas Sample : 1036 Litre					
Sl No	Test Parameters	Test Method	Unit	Results	
1.	Temperature of emission	IS 11255 : Part 3 : 2008	°C	33	
2.	Velocity of gas in duct	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	m/sec	18.72	
3.	Quantity of gas flow	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	NM ³ /hr	18054	
E. Results of gaseous emission :					
Sl No	Test Parameters	Test Method	Unit	Results	Norms as per CPCB
1.	Carbon monoxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	<0.2	Not Available
2.	Carbon dioxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	0.4	Not Available
3.	Particulate Matters	IS 11255 : Part 1 : 1985 RA 2009	mg/Nm ³	20	30 max.
F. Pollution control device					
Details of pollution control devices attached with the stack : Bag Filter.					

: END OF TEST REPORT :-

Report Verified by
(S. Mondal)



(J. MUKHERJEE)
Quality Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

BS

- * The test report shall not be reproduced, except in full, without written approval of the Company.
- * Results relate only to the parameters tested.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR

9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380/3381/3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



TC-7815

TEST REPORT

No. AP-FG/21-22/890

Date: January 13, 2022

Page 1 of 1

Issued to : M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)					
Address : Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.					
Your Ref. PO No. : 2800852844/NE13 dtd. 20.07.2021	Parameters Tested Physical : Temp., Velocity, Gas flow Chemical : CO, CO ₂ & PM				
Sample Description : Stack Gas					
Date & time of sampling : 01.01.2022 at 01:40 P.M. to 02:28 P.M.					
Test Completed on : 13.01.2022					
A. General information about stack :					
1. Stack connected to : Cement Mill No.-2 (OSEPA)					
2. Emission due to : Cement Grinding					
3. Material of construction of stack : M.S					
4. Shape of stack : Circular					
5. Whether stack is provided with permanent platform & ladder : Yes					
B. Physical characteristics of stack :					
1. Height of the stack (a) from ground level : 32.0 M (b) from roof level : ---					
2. Diameter of the stack (a) at bottom : --- (b) at top : 1.05 M					
3. Diameter of the stack at sampling point : 1.05 M					
4. No. of Traverse point : 12 Nos.					
5. Height of the sampling point from GL : 22.6 M					
C. Analysis / Characteristic of stack :					
1. Fuel used : Nil 2. Fuel consumption : Nil					
D. Results of Physical Parameters of Flue Gas :					
Barometric pressure : 760 mmHg.					
Volume of Gas Sample : 1056 Litre					
Sl No	Test Parameters	Test Method	Unit	Results	
1.	Temperature of emission	IS 11255 : Part 3 : 2008	°C	61	
2.	Velocity of gas in duct	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	m/sec	11.73	
3.	Quantity of gas flow	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	NM ³ /hr	31586	
E. Results of gaseous emission :					
Sl No	Test Parameters	Test Method	Unit	Results	Norms as per CPCB
1.	Carbon monoxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	<0.2	Not Available
2.	Carbon dioxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	0.3	Not Available
3.	Particulate Matters	IS 11255 : Part 1 : 1985 RA 2009	mg/Nm ³	<10 (06)	30 max.
F. Pollution control device					
Details of pollution control devices attached with the stack : Bag Filter.					

Report Verified by
(S. Mondal)



:- END OF TEST REPORT :-

(J. MUKHERJEE)
Quality Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

- * The test report shall not be reproduced, except in full, without written approval of the Company.
- * Results relate only to the parameters tested.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR

9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380 / 3381 / 3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



Certificate No. TC-7815

TEST REPORT

No. AP-FG/21-22/449

Date: September 16, 2021

Page 1 of 1

Issued to : M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)
Address : Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.
Your Ref. PO No. : 2800852844/NE13 dtd. 20.07.2021
Sample Description : Stack Gas
Date & time of sampling : 06.09.2021 at 11:00 A.M. to 11:30 A.M.
Test Completed on : 15.09.2021

Parameters Tested

Physical : Temp., Velocity, Gas flow
Chemical : SO₂, NO₂, CO, CO₂ & PM

A. General information about stack :

1. Stack connected to : DG - I
2. Emission due to : Burning of Furnace Oil
3. Material of construction of stack : M.S.
4. Shape of stack : Circular.
5. Whether stack is provided with permanent platform & ladder : Yes
6. Generator capacity : 6 MW

B. Physical characteristics of stack :

1. Height of the stack (a) from ground level : 60.0 M (b) from roof level : ---
2. Diameter of the stack (a) at bottom : --- (b) at top : 1.0 M
3. Diameter of the stack at sampling point : 1.0 M
4. No. of Traverse point : 12 Nos.
5. Height of the sampling point from GL : 30.0 M

C. Analysis / Characteristic of stack :

1. Fuel used : Furnace Oil

2. Fuel consumption : 1100 Lt./hr.

D. Results of Physical Parameters of Flue Gas :

Barometric pressure : 754 mmHg.

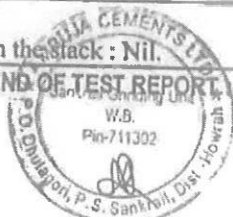
Volume of Gas Sample : 1152 Litre

Sl No	Test Parameters	Test Method	Unit	Results
1.	Temperature of emission	IS 11255 : Part 3 : 2008	°C	198
2.	Velocity of gas in duct	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	m/sec	10.16
3.	Quantity of gas flow	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	NM ³ /hr	18067
E. Results of gaseous emission :				
4.	Sulphur dioxide	IS 11255 : Part 2 : 1985 RA 2012	mg/Nm ³	129.2
5.	Nitrogen dioxide	IS 11255 : Part 7 : 2005 RA 2012	mg/Nm ³	159.2
6.	Carbon monoxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	<0.2
7.	Carbon dioxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	7.2
8.	Particulate Matters	IS 11255 : Part 1 : 1985 RA 2009	mg/Nm ³	92

E. Pollution control device

Details of pollution control devices attached with the stack : Nil.

END OF TEST REPORT



(J. MUKHERJEE)

Quality Manager

Authorised Signatory

For R.V.BRIGGS & CO. (P) LTD.

* The test report shall not be reproduced, except in full, without written approval of the Company.
* Results relate only to the parameters tested.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR

9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380 / 3381 / 3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



NABL ACCREDITED
LABORATORY
Certificate No. TC-7815

TEST REPORT

No. AP-FG/21-22/450

Date: September 16, 2021

Page 1 of 1

Issued to	: M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)		
Address	: Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.		
Your Ref. PO No.	: 2800852844/NE13 dtd. 20.07.2021	Parameters Tested <i>Physical</i> : Temp., Velocity, Gas flow <i>Chemical</i> : SO ₂ , NO ₂ , CO, CO ₂ & PM	
Sample Description	: Stack Gas		
Date & time of sampling	: 06.09.2021 at 11:45 A.M. to 12:21 P.M.		
Test Completed on	: 15.09.2021		

A. General information about stack :

1. Stack connected to : DG - II
2. Emission due to : Burning of Furnace Oil
3. Material of construction of stack : M.S.
4. Shape of stack : Circular.
5. Whether stack is provided with permanent platform & ladder : Yes
6. Generator capacity : 4 MW

B. Physical characteristics of stack :

1. Height of the stack (a) from ground level : 60.0 M (b) from roof level : ---
2. Diameter of the stack (a) at bottom : --- (b) at top : 1.0 M
3. Diameter of the stack at sampling point : 1.0 M
4. No. of Traverse point : 12 Nos.
5. Height of the sampling point from GL : 30.0 M

C. Analysis / Characteristic of stack :

1. Fuel used : Furnace Oil
2. Fuel consumption : 900 Lt./hr.

D. Results of Physical Parameters of Flue Gas :

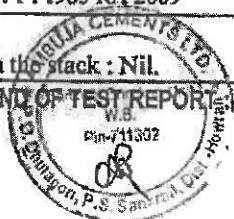
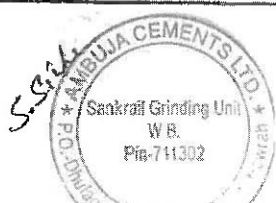
Barometric pressure : 754 mmHg.
Volume of Gas Sample : 1152 Litre

Volume of Gas Sample : 1152 Litre					
Sl No	Test Parameters	Test Method	Unit	Results	
1.	Temperature of emission	IS 11255 : Part 3 : 2008	°C	204	
2.	Velocity of gas in duct	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	m/sec	10.22	
3.	Quantity of gas flow	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	NM ³ /hr	17946	
E. Results of gaseous emission :					
4.	Sulphur dioxide	IS 11255 : Part 2 : 1985 RA 2012	mg/Nm ³	138.0	Not Available
5.	Nitrogen dioxide	IS 11255 : Part 7 : 2005 RA 2012	mg/Nm ³	- 170.0	Not Available
6.	Carbon monoxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	<0.2	Not Available
7.	Carbon dioxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	7.4	Not Available
8.	Particulate Matters	IS 11255 : Part 1 : 1985 RA 2009	mg/Nm ³	82	150 max.

E. Pollution control device

Details of pollution control devices attached with the stack : Nil.

END OF TEST REPORT



(J. MUKHERJEE)
Quality Manager

Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

SS

- * The test report shall not be reproduced, except in full, without written approval of the Company.
- * Results relate only to the parameters tested.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR

9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380 / 3381 / 3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



NABL ACCREDITED
LABORATORY
Certificate No. TC-7815

TEST REPORT

No. AP-FG/21-22/451

Date: September 16, 2021

Page 1 of 1

Issued to : M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)
Address : Jaladhulagori, VII & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.

Your Ref. PO No. : 2800852844/NE13 dtd. 20.07.2021

Sample Description : Stack Gas

Date & time of sampling : 06.09.2021 at 12:30 P.M. to 01:00 P.M.

Test Completed on : 15.09.2021

Parameters Tested

Physical : Temp., Velocity, Gas flow

Chemical : SO₂, NO₂, CO, CO₂ & PM

A. General Information about stack :

1. Stack connected to : DG - III
2. Emission due to : Burning of H.S.D
3. Material of construction of stack : M.S.
4. Shape of stack : Circular.
5. Whether stack is provided with permanent platform & ladder : Yes
6. Generator capacity : 1 MW

B. Physical characteristics of stack :

1. Height of the stack (a) from ground level : 60.0 M (b) from roof level : ---
2. Diameter of the stack (a) at bottom : --- (b) at top : 1.0 M
3. Diameter of the stack at sampling point : 1.0 M
4. No. of Traverse point : 12 Nos.
5. Height of the sampling point from GL : 30.0 M

C. Analysis / Characteristic of stack :

1. Fuel used : H.S.D

2. Fuel consumption : 900 Lt./hr.

D. Results of Physical Parameters of Flue Gas :

Barometric pressure : 754 mmHg.

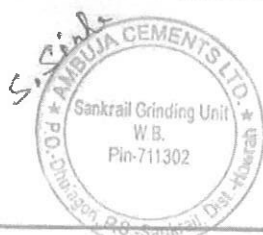
Volume of Gas Sample : 1620 Litre

Sl No	Test Parameters	Test Method	Unit	Results
1.	Temperature of emission	IS 11255 : Part 3 : 2008	°C	180
2.	Velocity of gas in duct	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	m/sec	10.50
3.	Quantity of gas flow	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	NM ³ /hr	19410
E. Results of gaseous emission :				
4.	Sulphur dioxide	IS 11255 : Part 2 : 1985 RA 2012	mg/Nm ³	133.0
5.	Nitrogen dioxide	IS 11255 : Part 7 : 2005 RA 2012	mg/Nm ³	156.0
6.	Carbon monoxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	<0.2
7.	Carbon dioxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	6.6
8.	Particulate Matters	IS 11255 : Part 1 : 1985 RA 2009	mg/Nm ³	65

E. Pollution control device

Details of pollution control devices attached with the stack : Nil.

END OF TEST REPORT :-



(J. MUKHERJEE)
Quality Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

- * The test report shall not be reproduced, except in full, without written approval of the Company.
- * Results relate only to the parameters tested.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR

9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380 / 3381 / 3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



NABL ACCREDITED
LABORATORY
Certificate No. TC-7515

TEST REPORT

No. AP-FG/21-22/443

Date: September 16, 2021

Page 1 of 1

Issued to : M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)
Address : Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.

Your Ref. PO No. : 2800852844/NE13 dtd. 20.07.2021

Sample Description : Stack Gas

Date & time of sampling : 01.09.2021 at 02:30 P.M. to 02:38 P.M.

Test Completed on : 15.09.2021

Parameters Tested

Physical : Temp., Velocity, Gas flow

Chemical : CO, CO₂ & PM

A. General information about stack :

1. Stack connected to : Wagon Tippler
2. Emission due to : Material transfer.
3. Material of construction of stack : M.S.
4. Shape of stack : Circular.
5. Whether stack is provided with permanent platform & ladder : Yes

B. Physical characteristics of stack :

1. Height of the stack (a) from ground level : 28.0 M (Approx) (b) from roof level : ---
2. Diameter of the stack (a) at bottom : --- (b) at top : 2.10 M
3. Diameter of the stack at sampling point : 2.10 M
4. No. of Traverse point : 24 Nos.
5. Height of the sampling point from GL : ---

C. Analysis / Characteristic of stack :

1. Fuel used : Nil

2. Fuel consumption : Nil

D. Results of Physical Parameters of Flue Gas :

Barometric pressure : 756 mmHg.

Volume of Gas Sample : 1104 Litre

Sl No	Test Parameters	Test Method	Unit	Results
1.	Temperature of emission	IS 11255 : Part 3 : 2008	°C	40
2.	Velocity of gas in duct	IS 11255 : Part 3 : 2008 RA 2010 (1 st Rev.)	m/sec	11.32
3.	Quantity of gas flow	IS 11255 : Part 3 : 2008 RA 2010 (1 st Rev.)	NM ³ /hr	129738

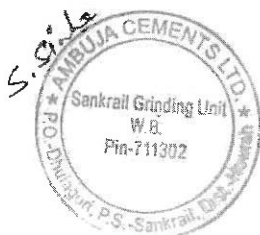
E. Results of gaseous emission :

1.	Carbon monoxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	<0.2	Not Available
2.	Carbon dioxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	0.3	Not Available
3.	Particulate Matters	IS 11255 : Part 1 : 1985 RA 2009	mg/Nm ³	07.0	30 max.

F. Pollution control device

Details of pollution control devices attached with the stack : Bag Filter.

END OF TEST REPORT :-



(J. MUKHERJEE)
Quality Manager

Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

* The test report shall not be reproduced, except in full, without written approval of the Company.
* Results relate only to the parameters tested.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR

9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380 / 3381 / 3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



NABL ACCREDITED
LABORATORY
Certificate No. TC-7815

TEST REPORT

No. AP-FG/21-22/438

Date: September 16, 2021

Page 1 of 1

Issued to : M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)
Address : Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.

Your Ref. PO No. : 2800852844/NE13 dtd. 20.07.2021

Sample Description : Stack Gas

Date & time of sampling : 31.08.2021 at 12:30 P.M. to 01:12 P.M.

Test Completed on : 15.09.2021

Parameters Tested

Physical : Temp., Velocity, Gas flow

Chemical : CO, CO₂ & PM

A. General information about stack :

- Stack connected to : Packer - 1
- Emission due to : Cement Packing
- Material of construction of stack : M.S
- Shape of stack : Circular
- Whether stack is provided with permanent platform & ladder : Yes

B. Physical characteristics of stack :

- Height of the stack (a) from ground level : 30.0 M (b) from roof level : —
- Diameter of the stack (a) at bottom : — (b) at top : 1.0 M
- Diameter of the stack at sampling point : 1.0 M
- No. of Traverse point : 12 Nos.
- Height of the sampling point from GL : 21.0 M

C. Analysis / Characteristic of stack :

- Fuel used : Nil
- Fuel consumption : Nil

D. Results of Physical Parameters of Flue Gas :

Barometric pressure : 754 mmHg.

Volume of Gas Sample : 1092 Litre

Sl No	Test Parameters	Test Method	Unit	Results
1.	Temperature of emission	IS 11255 : Part 3 : 2008	°C	45
2.	Velocity of gas in duct	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	m/sec	12.89
3.	Quantity of gas flow	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	NM ³ /hr	32806

E. Results of gaseous emission :

1.	Carbon monoxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	<0.2	Not Available
2.	Carbon dioxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	0.3	Not Available
3.	Particulate Matters	IS 11255 : Part 1 : 1985 RA 2009	mg/Nm ³	14	30 max.

F. Pollution control device

Details of pollution control devices attached with the stack : Bag Filter.

:- END OF TEST REPORT :-



(J. MUKHERJEE)
Quality Manager

Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

* The test report shall not be reproduced, except in full, without written approval of the Company.
* Results relate only to the parameters tested.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR

9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380 / 3381 / 3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



NABL ACCREDITED
LABORATORY
Certificate No. TC-7815

TEST REPORT

No. AP-FG/21-22/439

Date: September 16, 2021

Page 1 of 1

Issued to : M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)
Address : Jaladbulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.

Your Ref. PO No. : 2800852844/NE13 dtd. 20.07.2021

Sample Description : Stack Gas

Date & time of sampling : 31.08.2021 at 02:15 P.M. to 02:57 P.M.

Test Completed on : 15.09.2021

Parameters Tested

Physical : Temp., Velocity, Gas flow

Chemical : CO, CO₂ & PM

A. General information about stack :

1. Stack connected to : Packer - 2
2. Emission due to : Cement Packing
3. Material of construction of stack : M.S
4. Shape of stack : Circular.
5. Whether stack is provided with permanent platform & ladder : Yes

B. Physical characteristics of stack :

1. Height of the stack (a) from ground level : 30.0 M (b) from roof level : —
2. Diameter of the stack (a) at bottom : — (b) at top : 1.0 M
3. Diameter of the stack at sampling point : 1.0 M
4. No. of Traverse point : 12 Nos.
5. Height of the sampling point from GL : 21.0 M

C. Analysis / Characteristic of stack :

1. Fuel used : Nil

2. Fuel consumption : Nil

D. Results of Physical Parameters of Flue Gas :

Barometric pressure : 754 mmHg.

Volume of Gas Sample : 1092 Litre

Sl No	Test Parameters	Test Method	Unit	Results
1.	Temperature of emission	IS 11255 : Part 3 : 2008	°C	46
2.	Velocity of gas in duct	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	m/sec	12.92
3.	Quantity of gas flow	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	NM ³ /hr	32796

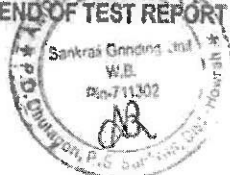
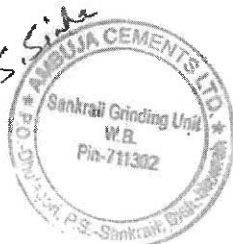
E. Results of gaseous emission :

1.	Carbon monoxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	<0.2	Not Available
2.	Carbon dioxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	0.4	Not Available
3.	Particulate Matters	IS 11255 : Part 1 : 1985 RA 2009	mg/Nm ³	09	30 max.

F. Pollution control device

Details of pollution control devices attached with the stack Bag Filter.

END OF TEST REPORT :-



(J. MUKHERJEE)
Quality Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR
9, BENTINCK STREET, KOLKATA - 700 001
Phone : (033) 4044-3380 / 3381 / 3382 / 3383, Fax : 33 2248-0447
E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com
CIN : U51109WB1931PTC007007



NABL ACCREDITED
LABORATORY
Certificate No. TC-7815

TEST REPORT

No. AP-FG/21-22/440

Date: September 16, 2021

Page 1 of 1

Issued to : M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)
Address : Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.

Your Ref. PO No. : 2800852844/NE13 dtd. 20.07.2021

Sample Description : Stack Gas

Date & time of sampling : 31.08.2021 at 03:15 P.M. to 04:03 P.M.

Test Completed on : 15.09.2021

Parameters Tested

Physical : Temp., Velocity, Gas flow

Chemical : CO, CO₂ & PM

A. General information about stack :

1. Stack connected to : Packer - 3
2. Emission due to : Cement Packing
3. Material of construction of stack : M.S
4. Shape of stack : Circular.
5. Whether stack is provided with permanent platform & ladder : Sample was taken from roof top.

B. Physical characteristics of stack :

1. Height of the stack (a) from ground level : 36.5 M (b) from roof level : —
2. Diameter of the stack (a) at bottom : — (b) at top : 1.1 M
3. Diameter of the stack at sampling point : 1.1 M
4. No. of Traverse point : 12 Nos.
5. Height of the sampling point from GL : 34.5 M

C. Analysis / Characteristic of stack :

1. Fuel used : Nil

2. Fuel consumption : Nil

D. Results of Physical Parameters of Flue Gas :

Barometric pressure : 754 mmHg.

Volume of Gas Sample : 1104 Litre

Sl No	Test Parameters	Test Method	Unit	Results
1.	Temperature of emission	IS 11255 : Part 3 : 2008	°C	42
2.	Velocity of gas in duct	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	m/sec	11.22
3.	Quantity of gas flow	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	NM ³ /hr	34816

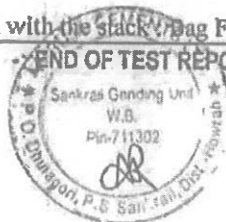
E. Results of gaseous emission :

1.	Carbon monoxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	<0.2	Not Available
2.	Carbon dioxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	0.2	Not Available
3.	Particulate Matters	IS 11255 : Part 1 : 1985 RA 2009	mg/Nm ³	17	30 max.

F. Pollution control device

Details of pollution control devices attached with the stack : Bag Filter.

END OF TEST REPORT :-



(J. MUKHERJEE)
Quality Manager

Authorised Signatory

For R.V.BRIGGS & CO. (P) LTD.

- * The test report shall not be reproduced, except in full, without written approval of the Company.
- * Results relate only to the parameters tested.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR

9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380 / 3381 / 3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



NABL ACCREDITED
LABORATORY
Certificate No. TC-7815

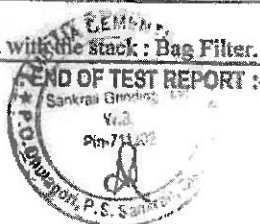
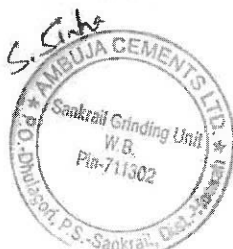
TEST REPORT

No. AP-FG/21-22/441

Date: September 16, 2021

Page 1 of 1

Issued to : M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)					
Address : Jaladholagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.					
Your Ref. PO No. : 2800852844/NE13 dtd. 20.07.2021	Parameters Tested Physical : Temp., Velocity, Gas flow Chemical : CO, CO ₂ & PM				
Sample Description : Stack Gas					
Date & time of sampling : 02.09.2021 at 11:30 A.M. to 12:18 P.M.					
Test Completed on : 15.09.2021					
A. General information about stack :					
1. Stack connected to : Packer - 4					
2. Emission due to : Cement Packing					
3. Material of construction of stack : M.S					
4. Shape of stack : Circular.					
5. Whether stack is provided with permanent platform & ladder : Yes.					
B. Physical characteristics of stack :					
1. Height of the stack (a) from ground level : 36.5 M (b) from roof level : —					
2. Diameter of the stack (a) at bottom : — (h) at top : 1.1 M					
3. Diameter of the stack at sampling point : 1.1 M					
4. No. of Traverse point : 12 Nos.					
5. Height of the sampling point from GL : 35.5 M					
C. Analysis / Characteristic of stack :					
1. Fuel used : Nil					
2. Fuel consumption : Nil					
D. Results of Physical Parameters of Flue Gas :					
Barometric pressure : 754 mmHg.					
Volume of Gas Sample : 1056 Litre					
Sl No	Test Parameters	Test Method	Unit	Results	
1.	Temperature of emission	IS 11255 : Part 3 : 2008	°C	39	
2.	Velocity of gas in duct	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	m/sec	10.95	
3.	Quantity of gas flow	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	NM ³ /hr	34307	
E. Results of gaseous emission :					
1.	Carbon monoxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	<0.2	Not Available
2.	Carbon dioxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	0.3	Not Available
3.	Particulate Matters	IS 11255 : Part 1 : 1985 RA 2009	mg/Nm ³	13	30 max.
F. Pollution control device					
Details of pollution control devices attached with the stack : Bag Filter.					



(J. MUKHERJEE)
Quality Manager

Authorized Signatory
For R.V.BRIGGS & CO. PRIVATE LTD.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR
9, BENTINCK STREET, KOLKATA - 700 001
Phone : (033) 4044-3380 / 3381 / 3382 / 3383, Fax : 33 2248-0447
E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com
CIN : U51109WB1931PTC007007



NABL ACCREDITED
LABORATORY
Certificate No. TC-7815

TEST REPORT

No. AP-FG/21-22/446

Date: September 16, 2021

Page 1 of 1

Issued to : M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)
Address : Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.

Your Ref. PO No. : 2800852844/NE13 dtd. 20.07.2021

Sample Description : Stack Gas

Date & time of sampling : 30.08.2021 at 03:30 P.M. to 04:06 P.M.

Test Completed on : 15.09.2021

Parameters Tested

Physical : Temp., Velocity, Gas flow

Chemical : CO, CO₂ & PM

A. General information about stack :

- Stack connected to : Cement Mill No.-1 (Mill Venting)
- Emission due to : Cement Grinding
- Material of construction of stack : M.S
- Shape of stack : Circular
- Whether stack is provided with permanent platform & ladder : Yes

B. Physical characteristics of stack :

- Height of the stack (a) from ground level : 32.0 M (b) from roof level : —
- Diameter of the stack (a) at bottom : — (b) at top : 1.05 M
- Diameter of the stack at sampling point : 1.05 M
- No. of Traverse point : 12 Nos.
- Height of the sampling point from GL : 22.6 M

C. Analysis / Characteristic of stack :

- Fuel used : Nil

2. Fuel consumption : Nil

D. Results of Physical Parameters of Flue Gas :

Barometric pressure : 754 mmHg.

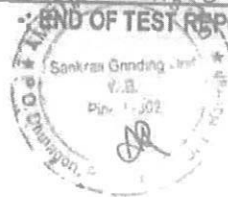
Volume of Gas Sample : 1116 Litre

SI No		Test Parameters	Test Method	Unit	Results	
1.		Temperature of emission	IS 11255 : Part 3 : 2008	°C	64	
2.		Velocity of gas in duct	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	m/sec	7.25	
3.		Quantity of gas flow	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	NM ³ /hr	19204	
E. Results of gaseous emission :						
1.		Carbon monoxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	<0.2	Not Available
2.		Carbon dioxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	0.3	Not Available
3.		Particulate Matters	IS 11255 : Part 1 : 1985 RA 2009	mg/Nm ³	02	30 max.

F. Pollution control device

Details of pollution control devices attached with the stack : Bag Filter.

END OF TEST REPORT :



(J. MUKHERJEE)
Quality Manager

Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR

9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380 / 3381 / 3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



NABL ACCREDITED
LABORATORY
Certificate No. TC-7915

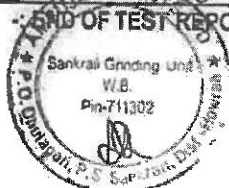
TEST REPORT

No. AP-FG/21-22/448

Date: September 16, 2021

Page 1 of 1

Issued to : M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)					
Address : Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.					
Your Ref. PO No. : 2800852844/NE13 dtd. 20.07.2021	Parameters Tested Physical : Temp., Velocity, Gas flow Chemical : CO, CO ₂ & PM				
Sample Description : Stack Gas					
Date & time of sampling : 30.08.2021 at 02:40 P.M. to 03:16 P.M.					
Test Completed on : 15.09.2021					
A. General Information about stack :					
1. Stack connected to : Cement Mill No.-2 (Mill Venting)					
2. Emission due to : Cement Grinding					
3. Material of construction of stack : M.S					
4. Shape of stack : Circular					
5. Whether stack is provided with permanent platform & ladder : Yes					
B. Physical characteristics of stack :					
1. Height of the stack (a) from ground level : 32.0 M (b) from roof level : ---					
2. Diameter of the stack (a) at bottom : --- (b) at top : 1.05 M					
3. Diameter of the stack at sampling point : 1.05 M					
4. No. of Traverse point : 12 Nos.					
5. Height of the sampling point from GL : 22.6 M					
C. Analysis / Characteristic of stack :					
1. Fuel used : Nil					
2. Fuel consumption : Nil					
D. Results of Physical Parameters of Flue Gas :					
Barometric pressure : 754 mmHg.					
Volume of Gas Sample : 1188 Litre					
Sl No	Test Parameters	Test Method	Unit	Results	
1.	Temperature of emission	IS 11255 : Part 3 : 2008	°C	84	
2.	Velocity of gas in duct	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	m/sec	8.42	
3.	Quantity of gas flow	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	Nm ³ /hr	20418	
E. Results of gaseous emission :					
1.	Carbon monoxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	<0.2	Not Available
2.	Carbon dioxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	0.5	Not Available
3.	Particulate Matters	IS 11255 : Part 1 : 1985 RA 2009	mg/Nm ³	17	30 max.
F. Pollution control device					
Details of pollution control devices attached with the stack : Bag Filter.					



(J. MUKHERJEE)
Quality Manager

Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

* The test report shall not be reproduced, except in full, without written approval of the Company.
* Results relate only to the parameters tested.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR
9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380 / 3381 / 3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



NABL ACCREDITED
LABORATORY
Certificate No. TC-7815

TEST REPORT

No. AP-FG/21-22/447

Date: September 16, 2021

Page 1 of 1

Issued to : M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)
Address : Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.

Your Ref. PO No. : 2800852844/NE13 dtd. 20.07.2021

Sample Description : Stack Gas

Date & time of sampling : 30.08.2021 at 04:20 P.M. to 05:08 P.M.

Test Completed on : 15.09.2021

Parameters Tested

Physical : Temp., Velocity, Gas flow

Chemical : CO, CO₂ & PM

A. General information about stack :

1. Stack connected to : Cement Mill No.-2 (OSEPA)
2. Emission due to : Cement Grinding
3. Material of construction of stack : M.S
4. Shape of stack : Circular
5. Whether stack is provided with permanent platform & ladder : Yes

B. Physical characteristics of stack :

1. Height of the stack (a) from ground level : 32.0 M (b) from roof level : ---
2. Diameter of the stack (a) at bottom : --- (b) at top : 1.05 M
3. Diameter of the stack at sampling point : 1.05 M
4. No. of Traverse point : 12 Nos.
5. Height of the sampling point from GL : 22.6 M

C. Analysis / Characteristic of stack :

1. Fuel used : Nil

2. Fuel consumption : Nil

D. Results of Physical Parameters of Flue Gas :

Barometric pressure : 754 mmHg.

Volume of Gas Sample : 1056 Litre

Sl No	Test Parameters	Test Method	Unit	Results
1.	Temperature of emission	IS 11255 : Part 3 : 2008	°C	84
2.	Velocity of gas in duct	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	m/sec	12.54
3.	Quantity of gas flow	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	NM ³ /hr	30423

E. Results of gaseous emission :

1.	Carbon monoxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	<0.2	Not Available
2.	Carbon dioxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	0.2	Not Available
3.	Particulate Matters	IS 11255 : Part 1 : 1985 RA-2009	mg/Nm ³	03	30 max.

F. Pollution control device

Details of pollution control devices attached with the stack : Bag Filter.



(J. MUKHERJEE)
Quality Manager

Authorised Signatory

For R.V.BRIGGS & CO. (P) LTD.

- * The test report shall not be reproduced, except in full, without written approval of the Company.
- * Results relate only to the parameters tested.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR

9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380 / 3381 / 3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



NABL ACCREDITED
LABORATORY
Certificate No. TC-7815

TEST REPORT

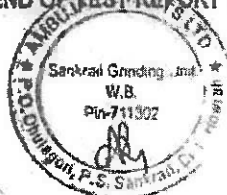
No. AP-FG/21-22/445

Date: September 16, 2021

Page 1 of 1

Issued to : M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)					
Address : Jaladhulagori, VII & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.					
Your Ref. PO No. : 2800852844/NE13 dtd. 20.07.2021	Parameters Tested				
Sample Description : Stack Gas	Physical : Temp., Velocity, Gas flow				
Date & time of sampling : 02.09.2021 at 02:30 P.M. to 02:58 P.M.	Chemical : CO, CO ₂ & PM				
Test Completed on : 15.09.2021					
A. General Information about stack :					
1. Stack connected to : Cement Mill No.-1 (Hopper)					
2. Emission due to : Material Transferring					
3. Material of construction of stack : M.S					
4. Shape of stack : Circular					
5. Whether stack is provided with permanent platform & ladder : Yes					
B. Physical characteristics of stack :					
1. Height of the stack (a) from ground level : 30.0 M (b) from roof level : —					
2. Diameter of the stack (a) at bottom : — (b) at top : 0.60 M					
3. Diameter of the stack at sampling point : 0.60 M					
4. No. of Traverse point : 8 Nos.					
5. Height of the sampling point from GL : 22.2 M					
C. Analysis / Characteristic of stack :					
1. Fuel used : Nil					
2. Fuel consumption : Nil					
D. Results of Physical Parameters of Flue Gas :					
Barometric pressure : 754 mmHg.					
Volume of Gas Sample : 1092 Litre					
Sl No	Test Parameters	Test Method	Unit	Results	
1.	Temperature of emission	IS 11255 : Part 3 : 2008	°C	38	
2.	Velocity of gas in duct	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	m/sec	19.06	
3.	Quantity of gas flow	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	NM ³ /hr	17906	
E. Results of gaseous emission :					
1.	Carbon monoxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	<0.2	Not Available
2.	Carbon dioxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	0.2	Not Available
3.	Particulate Matters	IS 11255 : Part 1 : 1985 RA 2009	mg/Nm ³	20	30 max.
F. Pollution control device					
Details of pollution control devices attached with the stack : Bag Filter.					

END OF TEST REPORT :



(J. MUKHERJEE)
Quality Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

- * The test report shall not be reproduced, except in full, without written approval of the Company.
- * Results relate only to the parameters tested.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR

9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380 / 3381 / 3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



NABL ACCREDITED
LABORATORY
Certificate No. TC-7815

TEST REPORT

No. AP-FG/21-22/442

Date: September 16, 2021

Page 1 of 1

Issued to : M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)
Address : Jaladhulagori, VIII & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.

Your Ref. PO No. : 2800852844/NE13 dtd. 20.07.2021

Sample Description : Stack Gas

Date & time of sampling : 01.09.2021 at 02:00 P.M. to 02:28 P.M.

Test Completed on : 15.09.2021

Parameters Tested

Physical : Temp., Velocity, Gas flow

Chemical : CO, CO₂ & PM

A. General Information about stack :

- Stack connected to : Cement Mill No.-2 (Hopper)
- Emission due to : Material Transferring
- Material of construction of stack : M.S
- Shape of stack : Circular
- Whether stack is provided with permanent platform & ladder : Yes

B. Physical characteristics of stack :

- Height of the stack (a) from ground level : 30.0 M (b) from roof level : ---
- Diameter of the stack (a) at bottom : --- (b) at top : 0.60 M
- Diameter of the stack at sampling point : 0.60 M
- No. of Traverse point : 8 Nos.
- Height of the sampling point from GL : 22.2 M

C. Analysis / Characteristic of stack :

- Fuel used : Nil

2. Fuel consumption : Nil

D. Results of Physical Parameters of Flue Gas :

Barometric pressure : 756 mmHg.

Volume of Gas Sample : 1036 Litre

Sl No	Test Parameters	Test Method	Unit	Results
1.	Temperature of emission	IS 11255 : Part 3 : 2008	°C	38
2.	Velocity of gas in duct	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	m/sec	18.13
3.	Quantity of gas flow	IS 11255:Part 3:2008 RA 2010 (1 st Rev.)	NM ³ /hr	17020

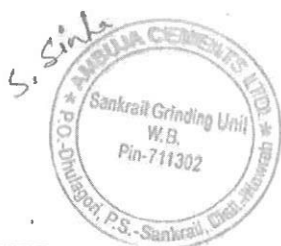
E. Results of gaseous emission :

1.	Carbon monoxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	<0.2	Not Available
2.	Carbon dioxide	IS 11255 : Part 1 : 1985 By Orsat	% v/v	0.4	Not Available
3.	Particulate Matters	IS 11255 : Part 1 : 1985 RA 2009	mg/Nm ³	12	30 max.

F. Pollution control device

Details of pollution control devices attached with the stack : Bag Filter.

:- END OF TEST REPORT :-



(J. MUKHERJEE)
Quality Manager

Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

- * The test report shall not be reproduced, except in full, without written approval of the Company.
- * Results relate only to the parameters tested.

Ambient Air Report



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR
9, BENTINCK STREET, KOLKATA - 700 001
Phone : (033) 4044-3380/3381/3382 / 3383, Fax : 33 2248-0447
E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com
CIN : U51109WB1931PTC007007



TC-7815

TEST REPORT

No. AP-AAQ/20-21/778A

Date: January 13, 2022

Page 1 of 1

Issued to	: M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)				
Address	: Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.				
Your P.O. No.	: 2800852844/NE13 dtd. 20.07.2021		Parameters Tested PM _{2.5} , PM ₁₀ , SO ₂ , NO ₂ , CO		
Sample Description	: Ambient Air				
Location	: Near Contractor's Room				
Date of monitoring	: 06.01.2022		Test Completed on	: 10.01.2022	
Time of sampling	: 10:00 A.M. - 10:00 A.M.		Duration of Sampling	: 24Hrs.	
TEST FINDINGS:-			Barometric Pressure : 754 - 750 mmHg Temperature : 21.0°C - 14.0°C		
Sl. No.	PARAMETERS	TEST METHOD	UNIT	Results (Time Weighted Avg.)	Norms as per MOE & F Notification New Delhi, 16 th November, 2009
1.	PM _{2.5} (Size ≤ 2.5µm)	USEPA 1997a,40 CFR Part 50, Appendix L.	µg/m ³	59	60 (24 Hourly.)
2.	PM ₁₀ (Size ≤ 10µm)	IS 5182 (Part - 23): 2006 Reaffirmed 2012	µg/m ³	92	100 (24 Hourly.)
3.	Sulphur Dioxide as SO ₂	IS 5182 (Part - 2): 2001 Reaffirmed 2012 (1st Rev.)	µg/m ³	4.2	80 (24 Hourly.)
4.	Nitrogen Dioxide as NO ₂	IS 5182 (Part - 6): 2006 Reaffirmed 2012 (1st Rev.)	µg/m ³	22.2	80 (24 Hourly.)
5.	Carbon Monoxide as CO	IS : 5182 (Part - 10), 1999 Non Dispersive Infra-Red (NDIR) spectroscopy	mg/m ³	1.15	04 (1 Hourly.)

-: END OF TEST REPORT :-

S. Sankar S. Mondal
Report Verified by
(S. Mondal)



(J. MUKHERJEE)
Quality Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR
9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380/3381/3382 / 3383, Fax : 33 2248-0447
E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com
CIN : U51109WB1931PTC007607



TC-7815

TEST REPORT

No. AP-AAQ/20-21/777A		Date: January 13, 2022		Page 1 of 1	
Issued to		: M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)			
Address		: Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.			
Your P.O. No.		: 2800852844/NE13 dtd. 20.07.2021		Parameters Tested PM _{2.5} , PM ₁₀ , SO ₂ , NO ₂ , CO	
Sample Description		: Ambient Air			
Location		: Near RO Plant			
Date of monitoring		: 07.01.2022		Test Completed on : 10.01.2022	
Time of sampling		: 11:00 A.M. - 11:00 A.M.		Duration of Sampling : 24Hrs.	
		Barometric Pressure : 754 - 750 mmHg Temperature : 24.0°C - 18.0°C			
TEST FINDINGS:-					
Sl. No.	PARAMETERS	TEST METHOD	UNIT	Results (Time Weighted Avg.)	Norms as per MOE & F Notification New Delhi, 16 th November, 2009
1.	PM _{2.5} (Size ≤ 2.5µm)	USEPA 1997a, 40 CFR Part 50, Appendix L.	µg/m ³	52	60 (24 Hourly.)
2.	PM ₁₀ (Size ≤ 10µm)	IS 5182 (Part - 23): 2006 Reaffirmed 2012	µg/m ³	84	100 (24 Hourly.)
3.	Sulphur Dioxide as SO ₂	IS 5182 (Part - 2): 2001 Reaffirmed 2012 (1st Rev.)	µg/m ³	<4.0	80 (24 Hourly.)
4.	Nitrogen Dioxide as NO ₂	IS 5182 (Part - 6): 2006 Reaffirmed 2012 (1st Rev.)	µg/m ³	24.6	80 (24 Hourly.)
5.	Carbon Monoxide as CO	IS : 5182 (Part - 10), 1999 Non Dispersive Infra-Red (NDIR) spectroscopy	mg/m ³	1.14	04 (1 Hourly.)

:- END OF TEST REPORT :-

S. Mondal
Report Verified by
(S. Mondal)



J. MUKHERJEE
Quality Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS

(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR

9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380/3381/3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



TC-7815

TEST REPORT

No. AP-AAQ/20-21/779A

Date: January 13, 2022

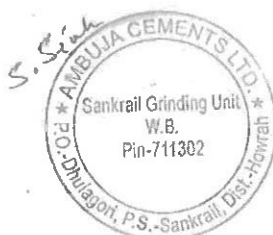
Page 1 of 1

Issued to	: M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)				
Address	: Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.				
Your P.O. No.	: 2800852844/NE13 dtd. 20.07.2021		Parameters Tested PM _{2.5} , PM ₁₀ , SO ₂ , NO ₂ , CO		
Sample Description	: Ambient Air				
Location	: Near Railway Gate				
Date of monitoring	: 06.01.2022		Test Completed on : 10.01.2022		
Time of sampling	: 10:30 A.M. - 10:30 A.M.		Duration of Sampling : 24Hrs.		
			Barometric Pressure : 754 - 750 mmHg		
			Temperature : 21.0°C - 14.0°C		
TEST FINDINGS:-					
Sl. No.	PARAMETERS	TEST METHOD	UNIT	Results (Time Weighted Avg.)	Norms as per MOE & F Notification New Delhi, 16 th November, 2009
1.	PM _{2.5} (Size ≤ 2.5µm)	USEPA 1997a, 40 CFR Part 50, Appendix L.	µg/m ³	58	60 (24 Hourly.)
2.	PM ₁₀ (Size ≤ 10µm)	IS 5182 (Part - 23): 2006 Reaffirmed 2012	µg/m ³	98	100 (24 Hourly.)
3.	Sulphur Dioxide as SO ₂	IS 5182 (Part - 2): 2001 Reaffirmed 2012 (1st Rev.)	µg/m ³	4.7	80 (24 Hourly.)
4.	Nitrogen Dioxide as NO ₂	IS 5182 (Part - 6): 2006 Reaffirmed 2012 (1st Rev.)	µg/m ³	24.9	80 (24 Hourly.)
5.	Carbon Monoxide as CO	IS : 5182 (Part - 10), 1999 Non Dispersive Infra-Red (NDIR) spectroscopy	mg/m ³	1.23	04 (1 Hourly.)

:- END OF TEST REPORT :-

S. Saha S. Mondal
Report Verified by
(S. Mondal)

(J. MUKHERJEE)
Quality Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.





R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR
9, BENTINCK STREET, KOLKATA - 700 001
Phone : (033) 4044-3380/3381/3382 / 3383, Fax : 33 2248-0447
E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com
CIN : U51109WB1931PTC007907

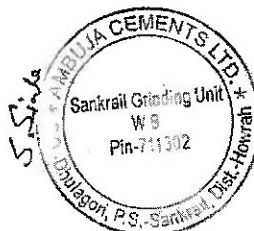


TEST REPORT

No. AP-AAQ/20-21/780A		Date: January 13, 2022		Page 1 of 1	
Issued to		: M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)			
Address		: Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.			
Your P.O. No.		: 2800852844/NE13 dtd. 20.07.2021		<u>Parameters Tested</u> PM _{2.5} , PM ₁₀ , SO ₂ , NO ₂ , CO	
Sample Description		: Ambient Air			
Location		: Near Transport Office			
Date of monitoring		: 07.01.2022		Test Completed on : 10.01.2022	
Time of sampling		: 10:30 A.M. - 10:30 A.M.		Duration of Sampling : 24Hrs.	
		Barometric Pressure : 754 - 750 mmHg Temperature : 24.0°C - 18.0°C			
TEST FINDINGS:-					
Sl. No.	PARAMETERS	TEST METHOD	UNIT	Results (Time Weighted Avg.)	Norms as per MOE & F Notification New Delhi, 16 th November, 2009
1.	PM _{2.5} (Size ≤ 2.5µm)	USEPA 1997a, 40 CFR Part 50, Appendix L.	µg/m ³	54	60 (24 Hourly.)
2.	PM ₁₀ (Size ≤ 10µm)	IS 5182 (Part - 23): 2006 Reaffirmed 2012	µg/m ³	93	100 (24 Hourly.)
3.	Sulphur Dioxide as SO ₂	IS 5182 (Part - 2): 2001 Reaffirmed 2012 (1st Rev.)	µg/m ³	4.5	80 (24 Hourly.)
4.	Nitrogen Dioxide as NO ₂	IS 5182 (Part - 6): 2006 Reaffirmed 2012 (1st Rev.)	µg/m ³	23.3	80 (24 Hourly.)
5.	Carbon Monoxide as CO	IS : 5182 (Part - 10), 1999 Non Dispersive Infra-Red (NDIR) spectroscopy	mg/m ³	1.24	04 (1 Hourly.)

:- END OF TEST REPORT :-

S. Mondal.
Report Verified by
(S. Mondal)



(J. MUKHERJEE)
Quality Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR

9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380 / 3381 / 3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



NABL ACCREDITED
LABORATORY
Certificate No. TC-7815

TEST REPORT

No. AP-AAQ/20-21/400

Date: September 15, 2021

Page 1 of 1

Issued to
Address

: M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)
: Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail,
Pin : 711302, West Bengal, India.

Your P.O. No.

: 2800852844/NE13 dtd. 20.07.2021

Sample Description

: Ambient Air

Location

: Near Contractor's Room

Parameters Tested

PM_{2.5}, PM₁₀, SO₂, NO₂, CO

Date of monitoring

: 02.09.2021

Time of sampling

: 10:00 A.M. - 10:00 A.M.

Test Completed on : 13.09.2021

Duration of Sampling : 24Hrs.

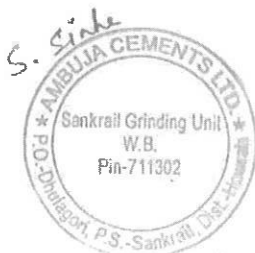
Barometric Pressure : 754 - 750 mmHg

Temperature : 34.0°C - 26.0°C

TEST FINDINGS:-

Sl. No.	PARAMETERS	TEST METHOD	UNIT	Results (Time Weighted Avg.)	Norms as per MOE & F Notification New Delhi, 16 th November, 2009
1.	PM _{2.5} (Size $\leq 2.5\mu\text{m}$)	USEPA 1997a, 40 CFR Part 50, Appendix L.	$\mu\text{g}/\text{m}^3$	37	60 (24 Hourly.)
2.	PM ₁₀ (Size $\leq 10\mu\text{m}$)	IS 5182 (Part - 23): 2006 Reaffirmed 2012	$\mu\text{g}/\text{m}^3$	53	100 (24 Hourly.)
3.	Sulphur Dioxide as SO ₂	IS 5182 (Part - 2): 2001 Reaffirmed 2012 (1st Rev.)	$\mu\text{g}/\text{m}^3$	5.5	80 (24 Hourly.)
4.	Nitrogen Dioxide as NO ₂	IS 5182 (Part - 6): 2006 Reaffirmed 2012 (1st Rev.)	$\mu\text{g}/\text{m}^3$	20.8	80 (24 Hourly.)
5.	Carbon Monoxide as CO	IS : 5182 (Part - 10), 1999 Non Dispersive Infra-Red (NDIR) spectroscopy	mg/m^3	1.19	04 (1 Hourly.)

:- END OF TEST REPORT :-



(J. MUKHERJEE)
Quality Manager

Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

* The test report shall not be reproduced, except in full, without written approval of the Company.
* Results relate only to the parameters tested.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR

9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380 / 3381 / 3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



NABL ACCREDITED
LABORATORY
Certificate No. TC-7815

TEST REPORT

No. AP-AAQ/20-21/401

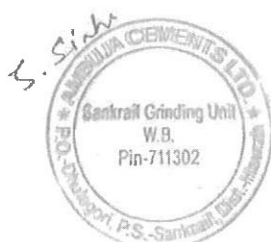
Date: September 15, 2021

Page 1 of 1

Issued to	: M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)				
Address	: Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.				
Your P.O. No.	: 2800852844/NE13 dtd. 20.07.2021		Parameters Tested PM _{2.5} , PM ₁₀ , SO ₂ , NO ₂ , CO		
Sample Description	: Ambient Air				
Location	: Near Railway Gate				
Date of monitoring	: 03.09.2021		Test Completed on : 13.09.2021		
Time of sampling	: 09:55 A.M. - 09:55 A.M.		Duration of Sampling : 24Hrs.		
TEST FINDINGS:-			Barometric Pressure : 754 - 750 mmHg Temperature : 34.0°C - 26.0°C		
Sl. No.	PARAMETERS	TEST METHOD	UNIT	Results (Time Weighted Avg.)	Norms as per MOE & F Notification New Delhi, 16 th November, 2009
1.	PM _{2.5} (Size ≤ 2.5µm)	USEPA 1997a,40 CFR Part 50, Appendix L.	µg/m ³	51	60 (24 Hourly.)
2.	PM ₁₀ (Size ≤ 10µm)	IS 5182 (Part - 23): 2006 Reaffirmed 2012	µg/m ³	87	100 (24 Hourly.)
3.	Sulphur Dioxide as SO ₂	IS 5182 (Part - 2): 2001 Reaffirmed 2012 (1st Rev.)	µg/m ³	5.9	80 (24 Hourly.)
4.	Nitrogen Dioxide as NO ₂	IS 5182 (Part - 6): 2006 Reaffirmed 2012 (1st Rev.)	µg/m ³	21.4	80 (24 Hourly.)
5.	Carbon Monoxide as CO	IS : 5182 (Part - 10), 1999 Non Dispersive Infra-Red (NDIR) spectroscopy	mg/m ³	1.27	04 (1 Hourly.)

:- END OF TEST REPORT :-

53



(J. MUKHERJEE)
Quality Manager

Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR
9, BENTINCK STREET, KOLKATA - 700 001
Phone : (033) 4044-3380 / 3381 / 3382 / 3383, Fax : 33 2248-0447
E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com
CIN : U51109WB1931PTC007007



NABL ACCREDITED
LABORATORY
Certificate No. TC-7815

TEST REPORT

No. AP-AAQ/20-21/402

Date: September 15, 2021

Page 1 of 1

Issued to	: M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)				
Address	: Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.				
Your P.O. No.	: 2800852844/NE13 dtd. 20.07.2021		<u>Parameters Tested</u>		
Sample Description	: Ambient Air		PM _{2.5} , PM ₁₀ , SO ₂ , NO ₂ , CO		
Location	: Near Transport Office				
Date of monitoring	: 04.09.2021		Test Completed on : 13.09.2021		
Time of sampling	: 10:10 A.M. - 10:10 A.M.		Duration of Sampling : 24Hrs.		
TEST FINDINGS:-			Barometric Pressure : 754 - 750 mmHg Temperature : 34.0°C - 26.0°C		
Sl. No.	PARAMETERS	TEST METHOD	UNIT	Results (Time Weighted Avg.)	Norms as per MOE & F Notification New Delhi, 16 th November, 2009
1.	PM _{2.5} (Size ≤ 2.5µm)	USEPA 1997a,40 CFR Part 50, Appendix L.	µg/m ³	35	60 (24 Hourly.)
2.	PM ₁₀ (Size ≤ 10µm)	IS 5182 (Part - 23): 2006 Reaffirmed 2012	µg/m ³	51	100 (24 Hourly.)
3.	Sulphur Dioxide as SO ₂	IS 5182 (Part - 2): 2001 Reaffirmed 2012 (1st Rev.)	µg/m ³	5.1	80 (24 Hourly.)
4.	Nitrogen Dioxide as NO ₂	IS 5182 (Part - 6): 2006 Reaffirmed 2012 (1st Rev.)	µg/m ³	18.5	80 (24 Hourly.)
5.	Carbon Monoxide as CO	IS : 5182 (Part - 10), 1999 Non Dispersive Infra-Red (NDIR) spectroscopy	mg/m ³	1.18	04 (1 Hourly.)

:- END OF TEST REPORT :-



(J. MUKHERJEE)
Quality Manager

Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

* The test report shall not be reproduced, except in full, without written approval of the Company.
* Results relate only to the parameters tested.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR

9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380 / 3381 / 3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



NABL ACCREDITED
LABORATORY
Certificate No. TC-7815

TEST REPORT

No. AP-AAQ/20-21/399

Date: September 15, 2021

Page 1 of 1

Issued to : M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)
Address : Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail,
Pin : 711302, West Bengal, India.

Your P.O. No. : 2800852844/NE13 dtd. 20.07.2021

Sample Description : Ambient Air

Location : Near RO Plant

Parameters Tested

PM_{2.5}, PM₁₀, SO₂, NO₂, CO

Date of monitoring : 01.09.2021

Time of sampling : 09:50 A.M. - 09:50 A.M.

Test Completed on : 13.09.2021

Duration of Sampling : 24Hrs.

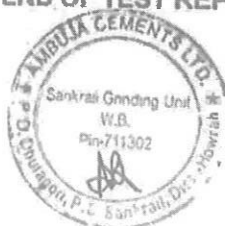
Barometric Pressure : 754 - 750 mmHg

Temperature : 34.0°C - 28.0°C

TEST FINDINGS:-

Sl. No.	PARAMETERS	TEST METHOD	UNIT	Results (Time Weighted Avg.)	Norms as per MOE & F Notification New Delhi, 16 th November, 2009
1.	PM _{2.5} (Size ≤ 2.5µm)	USEPA 1997a, 40 CFR Part 50, Appendix L.	µg/m ³	47	60 (24 Hourly.)
2.	PM ₁₀ (Size ≤ 10µm)	IS 5182 (Part - 23): 2006 Reaffirmed 2012	µg/m ³	78	100 (24 Hourly.)
3.	Sulphur Dioxide as SO ₂	IS 5182 (Part - 2): 2001 Reaffirmed 2012 (1st Rev.)	µg/m ³	5.4	80 (24 Hourly.)
4.	Nitrogen Dioxide as NO ₂	IS 5182 (Part - 6): 2006 Reaffirmed 2012 (1st Rev.)	µg/m ³	23.1	80 (24 Hourly.)
5.	Carbon Monoxide as CO	IS : 5182 (Part - 10), 1999 Non Dispersive Infra-Red (NDIR) spectroscopy	mg/m ³	1.21	04 (1 Hourly.)

:- END OF TEST REPORT :-



(J. MUKHERJEE)
Quality Manager

Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

Fugitive Report



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS

(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR

9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380/3381/3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



TC-7815

TEST REPORT

No. AP-AAQ/21-22/1158

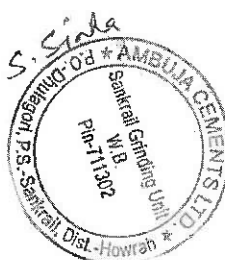
Date: April 05, 2022

Page 1 of 1

Issued to	: M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)				
Address	: Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Howrah-711302				
Your SAP PO No/Plant	: 2800852844/NE13, dtd. 20.07.2021		Parameters Tested RPM, SPM, SO ₂ , NO ₂ & CO		
Sample Description	: Fugitive Air.				
Location	: FA Unloading area				
Date of monitoring	: 31.03.2022		Test Completed on : 05.04.2022		
Time of sampling	: 10:30 A.M. - 06:30 P.M.		Duration of Sampling : 08 Hrs.		
			Barometric Pressure : 752 - 750 mmHg		
			Temperature : 35.0°C - 32.0°C		
TEST FINDINGS:-					
Sl. No.	PARAMETERS	TEST METHOD	UNIT	Results Time weighted average (8hrs.)	Norms as per Factory Act, 1948 (Time weighted average concentration)
1.	Respirable Particulate Matter	IS 5182 (Part - 23): 2006 Reaffirmed 2012	µg/m ³	1527	5000
2.	Suspended Particulate Matter	IS : 5182 (Part - 4),1999 Reaffirmed - 2010 (1 st Rev.)	µg/m ³	4385	10000
3.	Sulphur Dioxide as SO ₂	IS 5182 (Part - 2): 2001 Reaffirmed 2012 (1 st Rev.)	µg/m ³	<4.0	5000
4.	Nitrogen Dioxide as NO ₂	IS 5182 (Part - 6): 2006 Reaffirmed 2012 (1 st Rev.)	µg/m ³	21.6	6000
5.	Carbon Monoxide as CO	IS : 5182 (Part - 10), 1999 Non Dispersive Infra-Red (NDIR) spectroscopy	mg/m ³	2.46	40

-: END OF TEST REPORT :-

S. Mondal
Report Verified by
S. Mondal



R. Karim
(Dr. R. KARIM)
Technical Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR
9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380/3381/3382 / 3383, Fax : 33 2248-0447
E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com
CIN : U51109WB1931PTC007007



TC-7815

TEST REPORT

No. AP-AAQ/21-22/1159

Date: April 05, 2022

Page 1 of 1

Issued to	: M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)	
Address	: Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Howrah-711302	
Your SAP PO No/Plant	: 2800852844/NE13, dtd. 20.07.2021	Parameters Tested RPM, SPM, SO ₂ , NO ₂ & CO
Sample Description	: Fugitive Air.	
Location	: Wagon Tripler	
Date of monitoring	: 31.03.2022	Test Completed on : 05.04.2022
Time of sampling	: 10:30 A.M. - 06:30 P.M.	Duration of Sampling : 08 Hrs.

Barometric Pressure : 752 - 750 mmHg
Temperature : 34.0°C - 32.0°C

TEST FINDINGS:-

Sl. No.	PARAMETERS	TEST METHOD	UNIT	Results Time weighted average (8hrs.)	Norms as per Factory Act, 1948 (Time weighted average concentration)
1.	Respirable Particulate Matter	IS 5182 (Part - 23): 2006 Reaffirmed 2012	µg/m ³	1824	5000
2.	Suspended Particulate Matter	IS : 5182 (Part - 4), 1999 Reaffirmed - 2010 (1 st Rev.)	µg/m ³	6124	10000
3.	Sulphur Dioxide as SO ₂	IS 5182 (Part - 2): 2001 Reaffirmed 2012 (1 st Rev.)	µg/m ³	<4.0	5000
4.	Nitrogen Dioxide as NO ₂	IS 5182 (Part - 6): 2006 Reaffirmed 2012 (1 st Rev.)	µg/m ³	25.3	6000
5.	Carbon Monoxide as CO	IS : 5182 (Part - 10), 1999 Non Dispersive Infra-Red (NDIR) spectroscopy	mg/m ³	2.73	40

:- END OF TEST REPORT :-

S. Mondal
Report Verified by
S. Mondal



(Dr. R. KARIM)
Technical Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

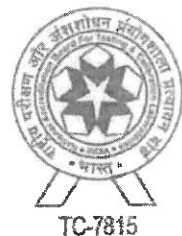


R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR
9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380/3381/3382 / 3383, Fax : 33 2248-0447
E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com
CIN : U51109WB1931PTC007007



TC-7815

TEST REPORT

No. AP-AAQ/21-22/1156

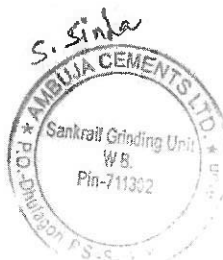
Date: April 05, 2022

Page 1 of 1

Issued to	: M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)				
Address	: Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Howrah-711302				
Your SAP PO No/Plant	: 2800852844/NE13, dtd. 20.07.2021		Parameters Tested RPM, SPM, SO ₂ , NO ₂ & CO		
Sample Description	: Fugitive Air.				
Location	: Clinker Silo (Stock Side & Gypsum Shed Between Area)				
Date of monitoring	: 30.03.2022		Test Completed on : 05.04.2022		
Time of sampling	: 10:10 A.M. - 06:10 P.M.		Duration of Sampling : 08 Hrs.		
			Barometric Pressure : 752 - 750 mmHg		
			Temperature : 34.0°C - 32.0°C		
TEST FINDINGS:-					
Sl. No.	PARAMETERS	TEST METHOD	UNIT	Results Time weighted average (8hrs.)	Norms as per Factory Act, 1948 (Time weighted average concentration)
1.	Respirable Particulate Matter	IS 5182 (Part - 23): 2006 Reaffirmed 2012	µg/m ³	2007	5000
2.	Suspended Particulate Matter	IS : 5182 (Part - 4), 1999 Reaffirmed - 2010 (1 st Rev.)	µg/m ³	4657	10000
3.	Sulphur Dioxide as SO ₂	IS 5182 (Part - 2): 2001 Reaffirmed 2012 (1 st Rev.)	µg/m ³	<4.0	5000
4.	Nitrogen Dioxide as NO ₂	IS 5182 (Part - 6): 2006 Reaffirmed 2012 (1 st Rev.)	µg/m ³	22.2	6000
5.	Carbon Monoxide as CO	IS : 5182 (Part - 10), 1999 Non Dispersive Infra-Red (NDIR) spectroscopy	mg/m ³	2.50	40

-: END OF TEST REPORT :-

S. Mondal.
Report Verified by
S. Mondal



(Dr. R. KARIM)
Technical Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS

(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR

9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380/3381/3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



TC-7815

TEST REPORT

No. AP-AAQ/21-22/1157

Date: April 05, 2022

Page 1 of 1

Issued to	: M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)		
Address	: Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Howrah-711302		
Your SAP PO No/Plant	: 2800852844/NE13, dtd. 20.07.2021	Parameters Tested RPM, SPM, SO ₂ , NO ₂ & CO	
Sample Description	: Fugitive Air.		
Location	: Loading Bay		
Date of monitoring	: 31.03.2022	Test Completed on : 05.04.2022	
Time of sampling	: 10:45 A.M. - 06:45 P.M.	Duration of Sampling : 08 Hrs.	

TEST FINDINGS:-

Barometric Pressure : 752 - 750 mmHg

Temperature : 38.0°C - 34.0°C

Sl. No.	PARAMETERS	TEST METHOD	UNIT	Results Time weighted average (8hrs.)	Norms as per Factory Act, 1948 (Time weighted average concentration)
1.	Respirable Particulate Matter	IS 5182 (Part - 23): 2006 Reaffirmed 2012	µg/m ³	1624	5000
2.	Suspended Particulate Matter	IS : 5182 (Part - 4), 1999 Reaffirmed - 2010 (1 st Rev.)	µg/m ³	2547	10000
3.	Sulphur Dioxide as SO ₂	IS 5182 (Part - 2): 2001 Reaffirmed 2012 (1 st Rev.)	µg/m ³	<4.0	5000
4.	Nitrogen Dioxide as NO ₂	IS 5182 (Part - 6): 2006 Reaffirmed 2012 (1 st Rev.)	µg/m ³	24.1	6000
5.	Carbon Monoxide as CO	IS : 5182 (Part - 10), 1999 Non Dispersive Infra-Red (NDIR) spectroscopy	mg/m ³	2.79	40

:- END OF TEST REPORT :-

S. Mondal
Report Verified by
S. Mondal



(Dr. R. KARIM)
Technical Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

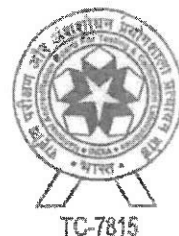


R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR
9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380/3381/3382 / 3383, Fax : 33 2248-0447
E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com
CIN : U51109WB1931PTC007007



TC-7815

TEST REPORT

No. AP-AAQ/21-22/1154

Date: April 05, 2022

Page 1 of 1

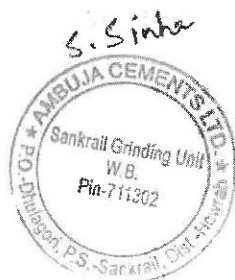
Issued to	: M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)	
Address	: Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Howrah-711302	
Your SAP PO No/Plant	: 2800852844/NE13, dtd. 20.07.2021	Parameters Tested RPM, SPM, SO ₂ , NO ₂ & CO
Sample Description	: Fugitive Air.	
Location	: Physical Building West Side	
Date of monitoring	: 30.03.2022	Test Completed on : 05.04.2022
Time of sampling	: 10:15 A.M. - 06:15 P.M.	Duration of Sampling : 08 Hrs.
		Barometric Pressure : 752 - 750 mmHg
		Temperature : 38.0°C - 34.0°C

TEST FINDINGS:-

Sl. No.	PARAMETERS	TEST METHOD	UNIT	Results Time weighted average (8hrs.)	Norms as per Factory Act, 1948 (Time weighted average concentration)
1.	Respirable Particulate Matter	IS 5182 (Part - 23): 2006 Reaffirmed 2012	µg/m ³	1208	5000
2.	Suspended Particulate Matter	IS : 5182 (Part - 4), 1999 Reaffirmed - 2010 (1 st Rev.)	µg/m ³	3667	10000
3.	Sulphur Dioxide as SO ₂	IS 5182 (Part - 2): 2001 Reaffirmed 2012 (1 st Rev.)	µg/m ³	<4.0	5000
4.	Nitrogen Dioxide as NO ₂	IS 5182 (Part - 6): 2006 Reaffirmed 2012 (1 st Rev.)	µg/m ³	24.6	6000
5.	Carbon Monoxide as CO	IS : 5182 (Part - 10), 1999 Non Dispersive Infra-Red (NDIR) spectroscopy	mg/m ³	3.33	40

-: END OF TEST REPORT :-

S. Mondal
Report Verified by
S. Mondal



R. Karim
(Dr. R. KARIM)
Technical Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR

9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380/3381/3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



TC-7815

TEST REPORT

No. AP-AAQ/21-22/1155

Date: April 05, 2022

Page 1 of 1

Issued to	: M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)		
Address	: Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Howrah-711302		
Your SAP PO No/Plant	: 2800852844/NE13, dtd. 20.07.2021	Parameters Tested RPM, SPM, SO ₂ , NO ₂ & CO	
Sample Description	: Fugitive Air.		
Location	: Roller Press (22 Mtr.)		
Date of monitoring	: 30.03.2022	Test Completed on	: 05.04.2022
Time of sampling	: 10:45 A.M. - 06:45 P.M.	Duration of Sampling	: 08 Hrs.

TEST FINDINGS:-

Barometric Pressure : 752 - 750 mmHg

Temperature : 35.0°C - 32.0°C

Sl. No.	PARAMETERS	TEST METHOD	UNIT	Results Time weighted average (8hrs.)	Norms as per Factory Act, 1948 (Time weighted average concentration)
1.	Respirable Particulate Matter	IS 5182 (Part - 23): 2006 Reaffirmed 2012	µg/m ³	1340	5000
2.	Suspended Particulate Matter	IS : 5182 (Part - 4), 1999 Reaffirmed - 2010 (1 st Rev.)	µg/m ³	3934	10000
3.	Sulphur Dioxide as SO ₂	IS 5182 (Part - 2): 2001 Reaffirmed 2012 (1 st Rev.)	µg/m ³	<4.0	5000
4.	Nitrogen Dioxide as NO ₂	IS 5182 (Part - 6): 2006 Reaffirmed 2012 (1 st Rev.)	µg/m ³	22.3	6000
5.	Carbon Monoxide as CO	IS : 5182 (Part - 10), 1999 Non Dispersive Infra-Red (NDIR) spectroscopy	mg/m ³	2.61	40

-: END OF TEST REPORT :-

S. Mondal
Report Verified by
S. Mondal



Dr. R. KARIM
(Dr. R. KARIM)
Technical Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR
9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380/3381/3382 / 3383, Fax : 33 2248-0447
E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com
CIN : U51109WB1931PTC007007



TC-7815

TEST REPORT

No. AP-AAQ/21-22/1150		Date: April 05, 2022		Page 1 of 1	
Issued to		: M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)			
Address		: Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Howrah-711302			
Your SAP PO No/Plant		: 2800852844/NE13, dtd. 20.07.2021		Parameters Tested RPM, SPM, SO ₂ , NO ₂ & CO	
Sample Description		: Fugitive Air.			
Location		: Cement Mill (Ground Floor)			
Date of monitoring		: 29.03.2022		Test Completed on : 05.04.2022	
Time of sampling		: 10:30 A.M. - 06:30 P.M.		Duration of Sampling : 08 Hrs.	
		Barometric Pressure : 752 - 750 mmHg Temperature : 38.0°C - 34.0°C			
TEST FINDINGS:-					
Sl. No.	PARAMETERS	TEST METHOD	UNIT	Results Time weighted average (8hrs.)	Norms as per Factory Act, 1948 (Time weighted average concentration)
1.	Respirable Particulate Matter	IS 5182 (Part - 23): 2006 Reaffirmed 2012	µg/m ³	1595	5000
2.	Suspended Particulate Matter	IS : 5182 (Part - 4), 1999 Reaffirmed - 2010 (1 st Rev.)	µg/m ³	4810	10000
3.	Sulphur Dioxide as SO ₂	IS 5182 (Part - 2): 2001 Reaffirmed 2012 (1 st Rev.)	µg/m ³	4.0	5000
4.	Nitrogen Dioxide as NO ₂	IS 5182 (Part - 6): 2006 Reaffirmed 2012 (1 st Rev.)	µg/m ³	22.5	6000
5.	Carbon Monoxide as CO	IS : 5182 (Part - 10), 1999 Non Dispersive Infra-Red (NDIR) spectroscopy	mg/m ³	2.63	40

:- END OF TEST REPORT :-

S. Mondal
Report Verified by
S. Mondal



R. Karim
(Dr. R. KARIM)
Technical Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS

(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR

9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380/3381/3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



TC-7815

TEST REPORT

No. AP-AAQ/21-22/1151

Date: April 05, 2022

Page 1 of 1

Issued to	: M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)		
Address	: Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Howrah-711302		
Your SAP PO No/Plant	: 2800852844/NE13, dtd. 20.07.2021	Parameters Tested RPM, SPM, SO ₂ , NO ₂ & CO	
Sample Description	: Fugitive Air.		
Location	: Packer 1 & 2 (Ground Floor)		
Date of monitoring	: 29.03.2022	Test Completed on	: 05.04.2022
Time of sampling	: 10:00 A.M. - 06:00 P.M.	Duration of Sampling	: 08 Hrs.

TEST FINDINGS:-

Barometric Pressure : 752 - 750 mmHg
Temperature : 38.0°C - 34.0°C

Sl. No.	PARAMETERS	TEST METHOD	UNIT	Results Time weighted average (8hrs.)	Norms as per Factory Act, 1948 (Time weighted average concentration)
1.	Respirable Particulate Matter	IS 5182 (Part -23): 2006 Reaffirmed 2012	µg/m ³	2460	5000
2.	Suspended Particulate Matter	IS : 5182 (Part - 4), 1999 Reaffirmed - 2010 (1 st Rev.)	µg/m ³	6088	10000
3.	Sulphur Dioxide as SO ₂	IS 5182 (Part - 2): 2001 Reaffirmed 2012 (1 st Rev.)	µg/m ³	4.1	5000
4.	Nitrogen Dioxide as NO ₂	IS 5182 (Part - 6): 2006 Reaffirmed 2012 (1 st Rev.)	µg/m ³	29.8	6000
5.	Carbon Monoxide as CO	IS : 5182 (Part - 10), 1999 Non Dispersive Infra-Red (NDIR) spectroscopy	mg/m ³	2.63	40

:- END OF TEST REPORT :-

S. Mondal
Report Verified by
S. Mondal



(Dr. R. KARIM)
Technical Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS

(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

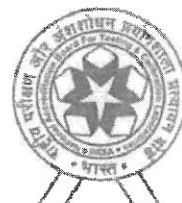
TAHER MANSION, 1ST FLOOR

9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380/3381/3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



TC-7815

TEST REPORT

No. AP-AAQ/21-22/1152

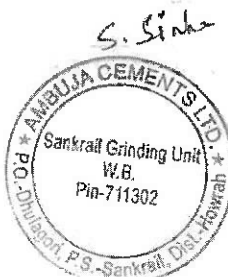
Date: April 05, 2022

Page 1 of 1

Issued to	: M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)				
Address	: Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Howrah-711302				
Your SAP PO No/Plant	: 2800852844/NE13, dtd. 20.07.2021		<u>Parameters Tested</u> RPM, SPM, SO ₂ , NO ₂ & CO		
Sample Description	: Fugitive Air.				
Location	: Packer 3 & 4 (1st Floor)				
Date of monitoring	: 29.03.2022		Test Completed on : 05.04.2022		
Time of sampling	: 10:00 A.M. - 06:00 P.M.		Duration of Sampling : 08 Hrs.		
			Barometric Pressure : 752 - 750 mmHg		
			Temperature : 35.0°C - 32.0°C		
<u>TEST FINDINGS:-</u>					
Sl. No.	PARAMETERS	TEST METHOD	UNIT	Results Time weighted average (8hrs.)	Norms as per Factory Act, 1948 (Time weighted average concentration)
1.	Respirable Particulate Matter	IS 5182 (Part - 23): 2006 Reaffirmed 2012	µg/m ³	3676	5000
2.	Suspended Particulate Matter	IS : 5182 (Part - 4), 1999 Reaffirmed - 2010 (1 st Rev.)	µg/m ³	7544	10000
3.	Sulphur Dioxide as SO ₂	IS 5182 (Part - 2): 2001 Reaffirmed 2012 (1 st Rev.)	µg/m ³	<4.0	5000
4.	Nitrogen Dioxide as NO ₂	IS 5182 (Part - 6): 2006 Reaffirmed 2012 (1 st Rev.)	µg/m ³	24.1	6000
5.	Carbon Monoxide as CO	IS : 5182 (Part - 10), 1999 Non Dispersive Infra-Red (NDIR) spectroscopy	mg/m ³	2.54	40

-: END OF TEST REPORT :-

S. Mondal
Report Verified by
S. Mondal



R. Karim
(Dr. R. KARIM)
Technical Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS

(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR

9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380/3381/3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



TC-7815

TEST REPORT

No. AP-AAQ/21-22/1153

Date: April 05, 2022

Page 1 of 1

Issued to	: M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)	
Address	: Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Howrah-711302	
Your SAP PO No/Plant	: 2800852844/NE13, dtd. 20.07.2021	Parameters Tested RPM, SPM, SO ₂ , NO ₂ & CO
Sample Description	: Fugitive Air.	
Location	: Hopper Building (West Side)	
Date of monitoring	: 29.03.2022	Test Completed on : 05.04.2022
Time of sampling	: 10:15 A.M. - 06:15 P.M.	Duration of Sampling : 08 Hrs.

Barometric Pressure : 752 - 750 mmHg
Temperature : 35.0°C - 32.0°C

TEST FINDINGS:-

Sl. No.	PARAMETERS	TEST METHOD	UNIT	Results Time weighted average (8hrs.)	Norms as per Factory Act, 1948 (Time weighted average concentration)
1.	Respirable Particulate Matter	IS 5182 (Part - 23): 2006 Reaffirmed 2012	µg/m ³	1373	5000
2.	Suspended Particulate Matter	IS : 5182 (Part - 4), 1999 Reaffirmed - 2010 (1 st Rev.)	µg/m ³	3977	10000
3.	Sulphur Dioxide as SO ₂	IS 5182 (Part - 2): 2001 Reaffirmed 2012 (1 st Rev.)	µg/m ³	<4.0	5000
4.	Nitrogen Dioxide as NO ₂	IS 5182 (Part - 6): 2006 Reaffirmed 2012 (1 st Rev.)	µg/m ³	20.1	6000
5.	Carbon Monoxide as CO	IS : 5182 (Part - 10), 1999 Non Dispersive Infra-Red (NDIR) spectroscopy	mg/m ³	3.58	40

-: END OF TEST REPORT :-

S. Mondal
Report Verified by
S. Mondal



(Dr. R. KARIM)
Technical Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR

9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380 / 3381 / 3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



NABL ACCREDITED
LABORATORY
Certificate No. TC-7815

TEST REPORT

No. AP-AAQ/21-22/412		Date: September 15, 2021		Page 1 of 1	
Issued to		: M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)			
Address		: Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.			
Sample Description		: Fugitive Air		Parameter Tested RPM, SPM, SO ₂ , NO ₂ & CO	
Location		: Wagon Trippler			
Date of monitoring		: 08.09.2021			
Test Completed on		: 13.09.2021			
Time of sampling		: 10:00 A.M. - 06:00 P.M.			
Duration of Sampling		: 08 Hrs.			
TEST FINDINGS:		Barometric Pressure : 754 - 748 mmHg Temperature : 32.0°C - 26.0°C			
Sl. No.	PARAMETERS	TEST METHOD	UNIT	Results (Time weighted average concentration) (8 hrs.)	Norms as per 2nd Schedule of Factory Act, 1987 (Time weighted average concentration) (8 hrs.)
1.	Respirable Particulate Matter	IS : 5182 (Part - 4) : 1999 Reaffirmed 2005 IS : 5182 (Part - 4) : 1999 Reaffirmed 2005	µg/m ³	2030	5000.0
2.	Suspended Particulate Matter	IS 5182 (Part - 4) : 1999 1st Revision	µg/m ³	5027	10000.0
3.	Sulphur Dioxide as SO ₂	IS 5182 (Part - 2) : 2001 Reaffirmed 2006	µg/m ³	4.20	5000.0
4.	Nitrogen Dioxide as NO ₂	IS 5182 (Part - 6) : 2006 1st Revision	µg/m ³	19.4	6000.0
5.	Carbon Monoxide as CO	IS : 5182 (Part - 10), 1999 Non Dispersive Infra-Red (NDIR) spectroscopy	mg/m ³	3.56625	40.0

:- END OF TEST REPORT :-



(J. MUKHERJEE)
Quality Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

- * The test report shall not be reproduced, except in full, without written approval of the Company.
- * Results relate only to the parameters tested.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR
9, BENTINCK STREET, KOLKATA - 700 001
Phone : (033) 4044-3380 / 3381 / 3382 / 3383, Fax : 33 2248-0447
E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com
CIN : U51109WB1931PTC007007



NABL ACCREDITED
LABORATORY
Certificate No. TC-7815

TEST REPORT

No. AP-AAQ/21-22/410		Date: September 15, 2021		Page 1 of 1	
Issued to		: M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)			
Address		: Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.			
Sample Description		: Fugitive Air		Parameter Tested RPM, SPM, SO ₂ , NO ₂ & CO	
Location		: Loading Bay			
Date of monitoring		: 07.09.2021			
Test Completed on		: 13.09.2021			
Time of sampling		: 10:15 A.M. - 06:15 P.M.			
Duration of Sampling		: 08 Hrs.			
TEST FINDINGS:					
Barometric Pressure : 754 - 748 mmHg					
Temperature : 32.0°C - 26.0°C					
Sl. No.	PARAMETERS	TEST METHOD	UNIT	Results (Time weighted average concentration) (8 hrs.)	Norms as per 2nd Schedule of Factory Act, 1987 (Time weighted average concentration) (8 hrs.)
1.	Respirable Particulate Matter	IS : 5182 (Part - 4): 1999 Reaffirmed 2005 IS : 5182 (Part - 4): 1999 Reaffirmed 2005	µg/m ³	1388	5000.0
2.	Suspended Particulate Matter	IS 5182 (Part - 4): 1999 1st Revision	µg/m ³	2455	10000.0
3.	Sulphur Dioxide as SO ₂	IS 5182 (Part - 2): 2001 Reaffirmed 2006	µg/m ³	5.15	5000.0
4.	Nitrogen Dioxide as NO ₂	IS 5182 (Part - 6): 2006 1st Revision	µg/m ³	17.8	6000.0
5.	Carbon Monoxide as CO	IS : 5182 (Part - 10), 1999 Non Dispersive Infra-Red (NDIR) spectroscopy	mg/m ³	2.78625	40.0

-: END OF TEST REPORT :-



(J. MUKHERJEE)
Quality Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

- * The test report shall not be reproduced, except in full, without written approval of the Company.
- * Results relate only to the parameters tested.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR

9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380 / 3381 / 3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007

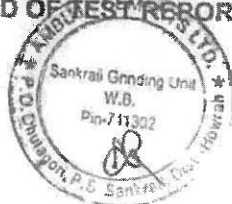
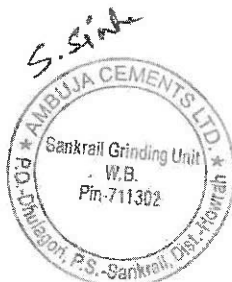


NABL ACCREDITED
LABORATORY
Certificate No. TC-7815

TEST REPORT

No. AP-AAQ/21-22/408		Date: September 15, 2021		Page 1 of 1	
Issued to Address		: M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL) : Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.			
Sample Description Location		: Fugitive Air : Roller Press (22 Mtr.)		Parameter Tested RPM, SPM, SO ₂ , NO ₂ & CO	
Date of monitoring		: 06.09.2021			
Test Completed on		: 13.09.2021			
Time of sampling		: 10:35 A.M. - 06:35 P.M.			
Duration of Sampling		: 08 Hrs.			
TEST FINDINGS:		Barometric Pressure : 754 - 748 mmHg Temperature : 32.0°C - 26.0°C			
Sl. No.	PARAMETERS	TEST METHOD	UNIT	Results (Time weighted average concentration) (8 hrs.)	Norms as per 2nd Schedule of Factory Act, 1987 (Time weighted average concentration) (8 hrs.)
1.	Respirable Particulate Matter	IS : 5182 (Part - 4): 1999 Reaffirmed 2005 IS : 5182 (Part - 4): 1999 Reaffirmed 2005	µg/m ³	4180	5000.0
2.	Suspended Particulate Matter	IS 5182 (Part - 4): 1999 1st Revision	µg/m ³	7656	10000.0
3.	Sulphur Dioxide as SO ₂	IS 5182 (Part - 2): 2001 Reaffirmed 2006	µg/m ³	5.39	5000.0
4.	Nitrogen Dioxide as NO ₂	IS 5182 (Part - 6): 2006 1st Revision	µg/m ³	17.0	6000.0
5.	Carbon Monoxide as CO	IS : 5182 (Part - 10), 1999 Non Dispersive Infra-Red (NDIR) spectroscopy	mg/m ³	2.6450	40.0

:- END OF TEST REPORT :-



(J. MUKHERJEE)
Quality Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

- * The test report shall not be reproduced, except in full, without written approval of the Company.
- * Results relate only to the parameters tested.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR

9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380 / 3381 / 3382 / 3383, Fax : 33.2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



NABL ACCREDITED
LABORATORY
Certificate No. TC-7815

TEST REPORT

No. AP-AAQ/21-22/404		Date: September 15, 2021		Page 1 of 1	
Issued to		: M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)			
Address		: Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.			
Sample Description		: Fugitive Air		Parameter Tested	
Location		: Packer 1 & 2 (Ground Floor)		RPM, SPM, SO₂, NO₂ & CO	
Date of monitoring		: 04.09.2021			
Test Completed on		: 13.09.2021			
Time of sampling		: 10:00 A.M. - 06:00 P.M.			
Duration of Sampling		: 08 Hrs.			
TEST FINDINGS:					
Barometric Pressure : 754 - 748 mmHg					
Temperature : 32.0°C - 26.0°C					
Sl. No.	PARAMETERS	TEST METHOD	UNIT	Results (Time weighted average concentration) (8 hrs.)	Norms as per 2nd Schedule of Factory Act, 1987 (Time weighted average concentration) (8 hrs.)
1.	Respirable Particulate Matter	IS : 5182 (Part - 4) : 1999 Reaffirmed 2005 IS : 5182 (Part - 4) : 1999 Reaffirmed 2005	µg/m ³	1870	5000.0
2.	Suspended Particulate Matter	IS 5182 (Part - 4) : 1999 1st Revision	µg/m ³	4974	10000.0
3.	Sulphur Dioxide as SO ₂	IS 5182 (Part - 2) : 2001 Reaffirmed 2006	µg/m ³	4.92	5000.0
4.	Nitrogen Dioxide as NO ₂	IS 5182 (Part - 6) : 2006 1st Revision	µg/m ³	19.3	6000.0
5.	Carbon Monoxide as CO	IS : 5182 (Part - 10), 1999 Non Dispersive Infra-Red (NDIR) spectroscopy	mg/m ³	2.9425	40.0

:- END OF TEST REPORT :-



(J. MUKHERJEE)
Quality Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

- ★ The test report shall not be reproduced, except in full, without written approval of the Company.
- ★ Results relate only to the parameters tested.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS
(AN ISO 9001:2015 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR

9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380 / 3381 / 3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



NABL ACCREDITED
LABORATORY
Certificate No. TC-7815

TEST REPORT

No. AP-AAQ/21-22/406		Date: September 15, 2021		Page 1 of 1	
Issued to		: M/S. AMBUJA CEMENTS LIMITED. (UNIT - SANKRAIL)			
Address		: Jaladhulagori, Vill & P.O. Dhulagori, P.S. Sankrail, Dist. Howrah, Sankrail, Pin : 711302, West Bengal, India.			
Sample Description		: Fugitive Air		<u>Parameter Tested</u>	
Location		: Hopper Building (West Side)		RPM, SPM, SO ₂ , NO ₂ & CO	
Date of monitoring		: 04.09.2021			
Test Completed on		: 13.09.2021			
Time of sampling		: 10:15 A.M. - 06:15 P.M.			
Duration of Sampling		: 08 Hrs.			
TEST FINDINGS:		Barometric Pressure : 754 - 748 mmHg Temperature : 32.0°C - 26.0°C			
Sl. No.	PARAMETERS	TEST METHOD	UNIT	Results (Time weighted average concentration) (8 hrs.)	Norms as per 2nd Schedule of Factory Act, 1987 (Time weighted average concentration) (8 hrs.)
1.	Respirable Particulate Matter	IS : 5182 (Part - 4): 1999 Reaffirmed 2005 IS : 5182 (Part - 4): 1999 Reaffirmed 2005	µg/m ³	3651	5000.0
2.	Suspended Particulate Matter	IS 5182 (Part - 4): 1999 1st Revision	µg/m ³	7322	10000.0
3.	Sulphur Dioxide as SO ₂	IS 5182 (Part - 2): 2001 Reaffirmed 2006	µg/m ³	4.69	5000.0
4.	Nitrogen Dioxide as NO ₂	IS 5182 (Part - 6): 2006 1st Revision	µg/m ³	21.4	6000.0
5.	Carbon Monoxide as CO	IS : 5182 (Part - 10), 1999 Non Dispersive Infra-Red (NDIR) spectroscopy.	mg/m ³	3.4575	40.0

-: END OF TEST REPORT :-



(J. MUKHERJEE)
Quality Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

- * The test report shall not be reproduced, except in full, without written approval of the Company.
- * Results relate only to the parameters tested.

Annexure-2

TEST REPORT

Name & Address of Customer :

Ambuja Cements Limited

Jaladhulagori, Vill & PO.- Dhulagori, PS.- Sankrail,
Dist.- Howrah, WB 711302

Report No. :

MSKGL/ED/2022-23/000007

Date :

25/04/2022

Sample No. :

MSKGL/ED/2021-22/03/02068

Drawn/Submitted on :

31/03/2022

Reference No. & Date :

COC. 30/03/2022

We hereby certify that the following sample drawn by us / submitted by the customer has been analyzed with the following results:

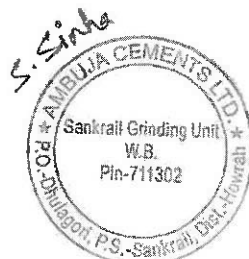
1. Description of sample (As declared by customer)	Effluent Water
2. Sample Mark (if any, given by the customer)	Waste Water from STP Outlet
3. Date of sampling	31/03/2022
4. Place of sampling	Jaladhulagori, Vill & PO.- Dhulagori, PS.- Sankrail, Dist.- Howrah WB 711302
5. Environmental conditions during sampling	Maintained
6. Sampling Plan & Procedures used	As per sop

ANALYSIS RESULT

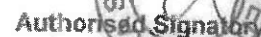
Chemical				
Sl No.	Test Parameters	Unit	Test Method	Result
1	pH value	None	APHA(23rd Edition) 4500-H-8	7.86 at 25 deg C
2	Total Suspended Solid (as TSS)	mg/l	APHA(23rd Edition)2540D	42
3	Biochemical Oxygen Demand (as BOD)	mg/l	APHA (23rd Edition) 5210B 2017	11
4	Chemical Oxygen Demand (COD)	mg/l	APHA (23rd Edition) 5220B, 2017	44
5	Oil and Grease	mg/l	APHA (23rd Edition) 5520B 2017	<5.0

DL : Detection Limit BDL : Below Detection Limit

Report Verified By

For Mitra S. K. Private Limited


 Authorised Signatory

* This results relate only to the item(s) tested.

* This Test Report shall not be reproduced except in full, without the permission of Mitra S. K. Private Limited.

Shrachi Centre (5th Floor), 74B, A.J.C. Bose Road, Kolkata - 700016, West Bengal, India.

Tel. : 91 33 40143000 / 22650007 Fax : 91 33 22650008

Email : info@mitrask.com Website : www.mitrask.com

Annexure-3

Ambuja Cement

ACL/SK/ENV/08-21/74

Date: 28.08.2021

To,
The West Bengal Pollution Control Board,
(Department of Environment, Govt. of West Bengal)
Howrah Regional Office,
Minority Bhawan, 5th Floor,
Near Alipore Police Court,
Kolkata: 700027

Kind Attention: Mrs. Barna Majumder
Regional Officer (Howrah Regional Office)

Sub: Environment Statement Report of M/s. Ambuja Cements Ltd (Unit: Sankrail) for the year 2020-2021


Madam,

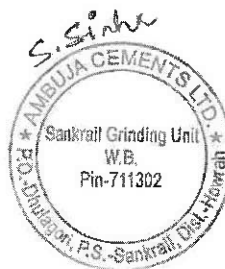
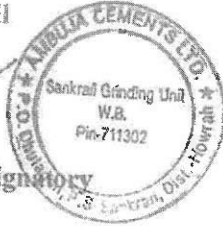
Please find enclosed herewith duly filled Form-V (Rule-14), Environment Statement Report (2020-2021) for your kind perusal.

This is for your kind information and necessary records.

Thanking you,
Yours faithfully,

For Ambuja Cements Ltd.
Unit: Sankrail


Authorised Signatory



AMBUJA CEMENTS LIMITED

Unit : Sankrail

Jaledhulagori, Vill. & P.O. : Dhulagori, P.S. : Sankrail, Dist. : Howrah (W.B.) - 711302

Phone : 033 - 6608 7100 (4 Lines), Fax : 033 2679 8423

(Regional Off. : "INDICON VIVA", 8th Floor, 53A, Leela Roy Sarani, Kolkata - 700 019, Phone : 033 - 4403 3900, Fax : 2461 7744 / 8413)

(Regd. Off. : P.O. : Ambujanagar, Taluka : Kodinar, District : Gir Somnath, Gujarat - 362715)

CIN Nos. L26942GJ1981 PLC004717, Website : www.ambujacement.com

AMBUJA CEMENTS LIMITED

UNIT: SANKRAIL

ANNUAL ENVIRONMENTAL STATEMENT

2020- 2021

FORM-"V"
(See Rule 14)

Environmental Statement for the Financial Year Ending on 31st March 2021

PART A

I	Name & Address of the Owner/Occupier of the Industry	Mr. Bhimsi Kachhot Vice President & Unit Head Village: Jaladhulagori, PO : Dhulagori, PS: Sankrail, Howrah-711302 Contact: 9820796131
II	Industry Category Primary- (STC Code) Secondary (STC Code)	Red
III	Production Capacity	2.40 million ton Cement per year
IV	Year of establishment	2001
V	Date of last Environmental Statement submitted	24.06.2020

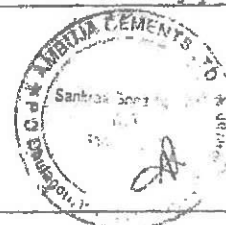
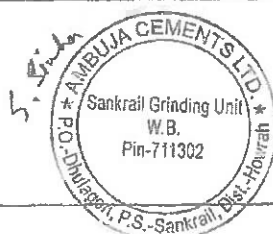
PART B

Water and Raw Material Consumption

I. Water Consumption m³/day

Sl No.	Particular	Unit	Qty
1	Water Consumption	m ³ /d	180 (approx)
2	Process	m ³ /d	Nil
3	Domestic	m ³ /d	160 (approx)
4	Boiler Feeding	m ³ /d	Nil
5	Cooling/ Industrial	m ³ /d	20 (approx)

Name of the Products	Process water consumption per unit of product output	
	During the previous Financial Year(2019-2020)	During the Current Financial Year(2020-2021)
	(1)	(2)
Cement	Not Applicable, Cement Production is a dry process	



AMBUJA CEMENTS LIMITED

UNIT: SANKRAIL

ANNUAL ENVIRONMENTAL STATEMENT

2020-2021

II. Raw Material Consumption

Name of Raw Materials	Name of product	Consumption of Raw Material per unit of output	
		During the previous Financial Year(2019-2020)	During the Current Financial Year(2020-2021)
Clinker	Cement	0.6100	0.6061
Gypsum		0.0392	0.0385
Fly ash		0.3333	0.3356
Granulated Slag/Normal Slag		0.0175	0.0197

PART - C

Pollutant discharged to environment/unit of output (Parameters as specified in the consent issued)

Pollutants	Quantity of Pollutants discharged [mass/day]	Concentrations of Pollutants discharges [mass/day]	Percentage of variation from prescribed standards with reasons	Statutory Limit
	ton/day	mg/Nm ³		mg/Nm ³
Cement Mill-1 Hopper	0.0061	14	NA	30
Cement Mill-1 Venting	0.0032	7	NA	
Roller Press	0.0125	10	NA	
Cement Mill-2 Hopper	0.0097	23	NA	
Cement Mill-2 Venting	0.0069	14	NA	
Cement Mill-2 Separator	0.0068	9	NA	
Packer-1	0.0181	23	NA	
Packer-2	0.0202	25	NA	
Packer-3	0.0125	15	NA	
Packer-4	0.0134	16	NA	
DG-1	0.0413	98	NA	150
DG-2	0.0362	85	NA	
DG-3	0.0088	51	NA	



S. Sinha



AMBUJA CEMENTS LIMITED

UNIT: SANKRAIL

ANNUAL ENVIRONMENTAL STATEMENT

2020- 2021

PART-D

Hazardous Wastes

As specified under the Hazardous Waste (Management, Handling and Transboundary), Rules 2016

Hazardous Wastes	Total Quantity disposed	
	During the previous Financial Year(2019-2020)	During the Current Financial Year(2020-2021)
(i) From process		
> Waste Oil	0.00 MT	0.00 MT
> Waste/Residue containing Oil	4.18 MT	4.07 MT
(ii) From Pollution Control facilities	Not Applicable	Not Applicable

PART-E

Solid Wastes

Wastes	Total Quantity	
	During the previous Financial Year(2019-2020)	During the Current Financial Year(2020-2021)
(a) From process	NA	NA
(b) From Pollution Control facilities	NA	NA
(c)	No solid waste is generated from Process and Pollution Control facilities	
(1) Quantity recycled or re-utilized within the unit		
(2) Sold	NA	NA
(3) Disposal	NA	NA



AMBUJA CEMENTS LIMITED

UNIT: SANKRAIL

ANNUAL ENVIRONMENTAL STATEMENT

2020- 2021

PART - F

Please specify the characterizations (in terms of composition of quantum) of hazardous as well as solid wastes and indicate disposal practice adopted for both these categories of wastes.

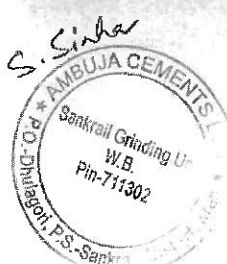
Hazardous waste generated(Used Oil & Grease) are disposed to PCB certified Recycler.

PART G

Impact of the Pollution Abatement Measures taken on conservation of natural resources and on the cost of production.

M/s. Ambuja Cements Ltd. our company is fully committed for conservation of environment & abide all rules & regulations as stated by State & Central pollution control board. The company has taken adequate measures to control fugitive dust emission by installing efficient and modern state of art pollution control equipment. Bag Filter/House is being attached to every stack so that the gases emitted to the surrounding atmosphere has components below or as per Statutory norms and do not cause harm to any living being in the surrounding. The dust collected in bag filters is recycled in process. The activities of the company have no adverse effect on the natural resources. Apart from that, we are taking several engineering controls & updating/upgrading the current facilities for the arresting spillages& fugitive emissions.

Automatic road sweeping machine and Water sprinkler is used for housekeeping and dust suppression respectively throughout the critical areas such as at the raw material stock yards, cement bag loading areas, truck yard and roads.



AMBUJA CEMENTS LIMITED

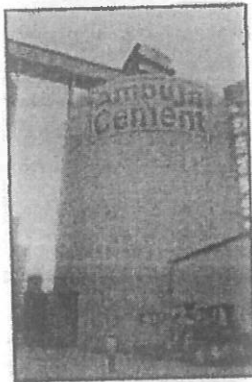
UNIT: SANKRAIL

ANNUAL ENVIRONMENTAL STATEMENT

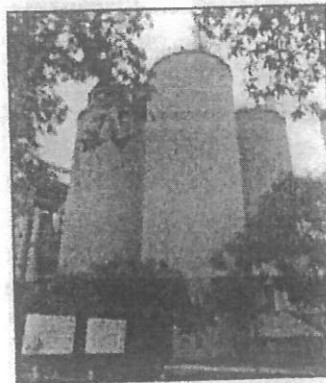
2020- 2021



Concrete Road with Pedestrian Pathway & Covered conveyors



Clinker Storage Silo



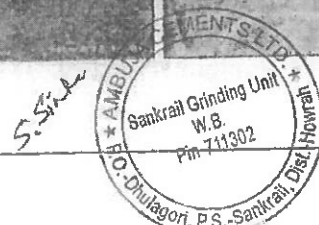
Cement Silo



Fly-Ash Silo

- **Water Management:** No waste water is generated from cement manufacturing process, as it is based on dry process technology. Domestic waste water generated from the colony is being treated in Sewage Water Reclamation Plant (SWRP) and treated water is being used for green belt development and for Water sprinkling on roads.
- **Storage Facility :** To control the dust emission effectively, M/s ACL stores the raw materials and end products in concrete silos.

In its endeavor to remain environment friendly, M/s ACL has made dedicated efforts for developing Green-Belt. We have planted almost 540 trees [includes Akashmoni, Mehogony and Sisoo] during the period from April'20 to March'21 (Survival rate > 95%).



AMBUJA CEMENTS LIMITED

UNIT: SANKRAIL

ANNUAL ENVIRONMENTAL STATEMENT

2020- 2021



PART - H

Additional Measures / Investment Proposal for environmental protection including abatement of pollution, prevention of pollution.

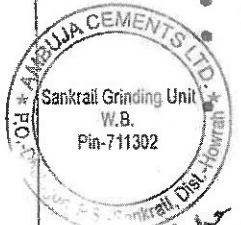
Total expenditure towards environment pollution control measure is INR. 26,03,702 during April'20-Mar'21 including the cost incurred to maintain the bag filters during this period is Rs. 5,32,342. Also Capital expenditure of 52 lakh is under execution process in 2021.

PART - I

Any other particulars for improving the quality of the environment.

The Corporate Philosophy of Ambuja Cements Ltd. is to develop and grow along with considering the interests of employees and community at large. Hence the company always gives highest priority to the quality of environment in its vicinity. For serving the aforesaid purpose, the company has taken serious efforts for up-gradation of the surrounding environmental condition.

- Installed Continuous Ambient Air Quality Monitoring Station (CAAQMS) at plant to monitor Ambient Air Quality continuously and display board installed at the Main gate facing the road for the public.
- Meteorological station comprising facilities to monitor rainfall, maximum and minimum temperature, relative humidity, barometric pressure, wind direction, velocity, and solar radiation has been established
- Installed Continuous Dust Monitoring Systems at various chimney stacks.
- Reuse of recycled water from Sewage Treatment Plant for gardening and dust suppression through water sprinkler.
- Ensure Preventive Maintenance Routines (PMRs) for all Bag Filters and 100% execute A complete Survey done for effectiveness by M/s Techsol consultant (Rs. 3.88 lacs)
- Bag filter wise action plan prepared for improvement
- Total 12 bag Filter's bags have been already replaced based on observation (Replaced: 994 bags, Cost: Rs. 3.63 Lacs)
- Carried a joint survey with a solution provider (M/s Hosch) for spillage control in entire circuit of plant. Total expenses is 33.67 lacs



S. Sank

AMBUJA CEMENTS LIMITED

UNIT: SANKRAIL

ANNUAL ENVIRONMENTAL STATEMENT

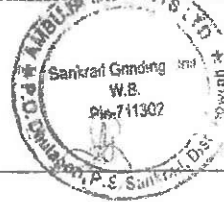
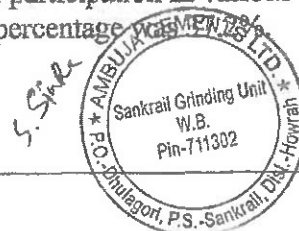
2020- 2021

- Modification of transfer points which generates fugitive dust
- Install polymer liners to reduce damage of cement bags
- Excavated ponds at nearby villages to harvest rain water.
- Providing drinking (RO) water to nearby two villages.
- Three new SHGs were formed two in Nubghara village and one in Bhagabatipur Village
- We linked our SHG members in Govt health insurance scheme in support of Panchayat & block office.
- To deal with the COVID-19 pandemic situation this financial year started with complete lockdown. Looking at this emergency situation as a sensible and committed on responsibility our Health team has initiated various initiatives at community level (within 4 Core Villages) through its Health Volunteers along with ICDS worker and ASHAs to deal with the present pandemic situation.
- **Skill development** through e-learning or virtual platform has gained increased importance and acceptance in view of the challenges posed by Covid-19. Similarly, innovation in skill development focused on online models has become a key strategy for SEDI across the country. Likewise SEDI at Sankrail has adopted similar strategy to cope up with Covid-19 pandemic situation and achieve sustainable livelihood by strengthening their vocational skills through quality training. Achievements of SEDI Sankrail are:

Partnership: NABARD sanctioned a project of Rs. 11.98 lakhs for skill development of 160 youths in November, 2020 & project has been completed by March, 2021. Partnership with TVS Motors for Automobile 2 & 3 Wheeler Repairing Technician job role has been well continued this year. TVS has also conducted assessment of 5 Batches and provided OJT support to 32 trainees who have passed the assessment. We have also established knowledge partnership with Shiva Consultancy for Customer Care Executive job role and PM Garments for ISMO job role.

Awareness-building and Mobilization of Youth: Mediums like Facebook Campaigning, Whatsapp bulk messages, KaushalMitra, News Paper Advertisement, local NGOs were used to mobilize candidates along with very limited field movement. SEDI Sankrail reached out 78 villages through its publicity events and information dissemination. Total 864 youths were reached and 408 youth were enrolled. Compared to last year, 42% female inquiries have increased.

Training Achievements: SEDI Sankrail has trained 390 trainees (achieving 92.42% of the yearly target). SEDI Sankrail has run training on 6 Job Roles & 21 Batches through on-line & Off-line mode. On the basis of need assessment during the pandemic, SEDI Sankrail has introduced two new courses i.e. Desktop Publishing Associate (DTP) based Entrepreneurship and Smartphone Software Installation and Repairing based Entrepreneurship. We have introduced virtual parents meeting. Sankrail SEDI has provided special focus to improve the women participation in various training Courses and their placement. Last year female enrollment percentage was 78%.



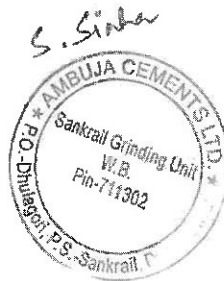
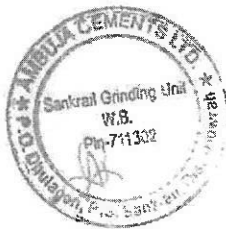
AMBUJA CEMENTS LIMITED

UNIT: SANKRAIL

ANNUAL ENVIRONMENTAL STATEMENT

2020-2021

Placement: An Alumni Survey of 4400 ex-trainees of SEDI Sankrail has been conducted by the SEDI Team to understand the effect of COVID-19 Pandemic on their livelihood. Total 31 new employers were identified. One virtual employer meet was organized, which was very fruitful for SEDI as employers discussed about their experience, expectations and requirements during pandemic situation. As on March, 2021 placement percentage was 51.54%. Due to 2nd wave of pandemic and lockdown trainees who have completed their training in the month of February and March, 2021 could not be placed. The placement of unplaced candidates is on the process and will be placed after lockdown. During 2020-21 a focused placement intervention was taken by the SEDI Sankrail to mobilize, counsel and place ex-trainees of DDU-GKY project and proper documentation of placement as per DDU-GKY SOP. Under this initiative, 258 ex-trainees of DDU-GKY were mobilized and 201 trainees were placed and out of 201 placed trainees we have completed full documentation of 145 trainees.



Annexure-4

NAME OF INDUSTRY AMBUJA CEMENT EASTERN LTD

ADDRESS

VILL & P.O. - JALADHULAGORI, P.S. - SANKRAIL,

DIST. - HOWRAH, WEST BENGAL

PIN - 711302

TYPE OF INDUSTRY

CEMENT

CATEGORY

RED



WEST BENGAL POLLUTION CONTROL BOARD

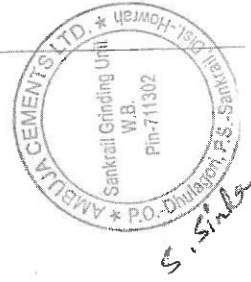
Head Office :

PARIBESH BHAWAN

**10 A, Block-LA, Sector-III, Salt Lake City,
Kolkata - 700 098**

Phone : (033) 2335-9088, 2335-8212, 2335-6731, 2335-0261

Sl. No.	Date & time (from-to) of inspection	Name & designation of the inspecting officer(s) with name of office of WBPCB	Name & designation of person(s) of the industry met during inspection	Observation of the inspecting Officer(s)	Liquid samples collected (Yes/No) If yes, no. of samples collected	Gaseous samples collected (Yes/No) If yes, no. of samples collected	Suggestions made to the unit (if any)	Signature of the inspecting Officer (s) with date & stamp
16.	6.9.21 11 am to 5 PM	S. MATHAN MOHAN, AEE, WBPCB	Smt A. RUP, Asst. Insp. (Gr)	Plt no 2 was in operation during unit. Plt no 2 was under maintenance. Related steam emission was insignificant. Overall steam monitoring system was functioning (PMS, PM10, SO2, NO2). The unit was in partial start-up monitoring. Unit was in functional stage. But inspection for hopper & hopper. But hopper 2 is in functional stage. STP was operational.	-	Yes (of mts) Packer - 1 " - 2 " - 3 Cement mill 2 (BGR) Hopper 1, 2 Ball mill 11-12 min delay.	The unit should make hopper online monitoring system functional & inform the unit. - Unit should not store 8/m in the open area without covers. - All cases to be taken for control fugitive emission around 7/m sector, hopper, bagging etc. - Unit should take all steps to control fugitive emission from various sources.	<i>[Signature]</i> 6/9/21
17.	17.12.21 10 am to 6 PM	Smt G.P. Singh, Scientist (Gr) WBPCB Smt B. Prasad, E.E. WBPCB Smt C. Manoj, Dy. Asst. Insp. Smt C. Dhan, AEE, WBPCB Smt S. Mahesh, AEE, WBPCB of the joint inspection team on pm. Health & safety. 01/12/21 in consultation with O.A. no. 98/2021/EZ.	Mrs. Siddhi Lakshmi, P. Asst. Insp. (Gr) WBPCB Mr. S. Srinivas, Asst. Insp. (Gr) WBPCB Smt A. RUP, Asst. Insp. (Gr)	Both Cement Mills were in operation. However, especially near the production area, was found to be very dusty.	-	10 mts Packer 1, 2, 3, 4 Cement mill 2 (BGR) Hopper 1, 2 Ball mill	Unit should take steps to minimize dust generation from truck loading section.	<i>[Signature]</i> 23/3/22
18.	29/3/22 10:00 AM to 12:45 PM	C. DAWN, AEE, WBPCB Houder R.O.	Smt B. Kalyani, Asst. Insp. (Gr) WBPCB Smt Y. Sharmila, Asst. Insp. (Gr) WBPCB	The plant was in full fledged operation. Stack emissions visible in the air. Unit has taken appropriate initiative to develop more greenery. Dust generation was there due to vehicle movement in the truck loading section. Unit has taken good steps to cover raw materials in different yards.	At	Yes 10 (ten) mts.	Unit should take steps to minimize dust generation from truck loading section.	<i>[Signature]</i> 23/3/22
19.	14/06/2022 10:00 AM to 12:50 PM	NUR R. SENVUPTA, AEE, HANAHU Plant Head B. T. KADAR AEE, HANAHU R.O. S. NUR R. JEE, AEE, HANAHU R.O.	Sr. B. Kalyani, Asst. Insp. (Gr) WBPCB Smt Y. Sharmila, Asst. Insp. (Gr) WBPCB Smt S. S. Srinivas, Asst. Insp. (Gr) WBPCB	The plant was in operation with Plant no. 2 and all related facilities. Cement mill no. 1 was under maintenance. Dust generation was observed due to vehicle movement and loading of trucks in port loading area and flyash unloading area.	No.	No. 6 nos.	Unit should take steps to minimize dust generation from truck loading section.	<i>[Signature]</i> 14/06/2022



Annexure-5

**Press Information Bureau
Government of India
Ministry of Finance**

07-June-2017 11:28 IST

The Central Government abolished various Cesses in the last three years for smooth roll-out of GST

The Central Government in the last three General Budgets viz 2015-16, 2016-17 and 2017-18 has gradually abolished various cesses on goods and services in order to prepare the ground for smooth roll-out of Goods and Service Tax (GST) from 1st July, 2017. The Central Government has taken this step in stages by abolishing various cesses so that it is easier to fit in various goods and services in different tax slabs for GST.

The Central Government in its General Budget 2015-16 had abolished Education Cess, including Secondary and Higher Education Cess on taxable services, and exempted Education Cess on excisable goods as well as Secondary and Higher Education Cess on excisable goods.

In its General Budget 2016-17, the Central Government abolished cess on cement, strawboard, three cesses including cess on Iron Ore Mines, Manganese Ore Mines and Chrome Ore Mines by amending Labour Welfare Cess Act, 1976, Tobacco cess by amending the Tobacco Cess Act 1975, and Cine Workers Welfare Cess by amending the Cine Workers' Welfare Cess Act 1981 among others.

In its General Budget 2017-18, the Central Government abolished Research and Development cess by amending the Research and Development Cess Act.

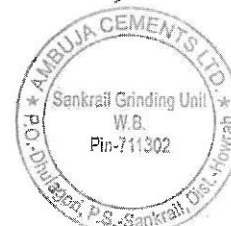
Through Taxation Laws Amendment Act 2017, the following cesses are abolished. However, the date of the implementation will coincide with the date of the GST roll-out:

- i) The Rubber Act 1947 – Cess on Rubber
- ii) The Industries (Development and Regulation) Act 1951 – Cess on Automobile
- iii) The Tea Act 1953 – Cess on Tea
- iv) The Coal Mines (Conservation and Development) Act, 1974 – Cess on Coal
- v) The Beedi Workers' Welfare Cess Act 1971 – Cess on Beedis
- vi) The Water (Prevention and Control of Pollution) Cess Act 1977 – Cess levied on Water consumed by certain industries and by local authorities.
- vii) The Sugar Cess Act 1982, the Sugar Development Fund Act 1982 – Cess on Sugar
- viii) The Jute Manufacturers Cess Act 1983 – Cess on Jute Goods manufactured or produced or in part of Jute.
- ix) The Finance (2) Act 2004 – Education Cess on Excisable Goods
- x) The Finance Act, 2007 – Secondary and Higher Education Cess on Excisable Goods
- xi) The Finance Act 2010 – Clean Energy Cess
- xii) The Finance Act 2015 – Swachh Bharat Cess
- xiii) The Finance Act 2016 – Infrastructure Cess and Krishi Kalyan Cess

However, the following cesses will continue to be levied under the GST regime since they pertain to customs or goods which are not covered under the GST regime:

- i) The Finance (2) Act 2004 – Education Cess on Imported Goods
- ii) The Finance Act, 2007 – Secondary and Higher Education Cess on Imported Goods
- iii) Cess on Crude Petroleum Oil under the Oil Industry Development Act, 1974
- iv) Additional Duty of Excise on Motor Spirit (Road Cess)
- v) Additional Duty of Excise on High Speed Diesel Oil (Road Cess)
- vi) Special Additional Duty of Excise on Motor Spirit
- vii) NCCD on Tobacco and Tobacco Products and Crude Petroleum Oil.

DSM/KA



ANNEXURE-III : DATE WISE AAQ DATA

Date wise AAQ Results

Project Site						AAQ-1
S.No.	Date	PM10 (µg/m3)	PM2.5 (µg/m3)	SO2 (µg/m3)	NOx (µg/m3)	CO (mg/m3)
1	05.03.2022	57.2	30.5	9.7	19.5	0.44
2	07.03.2022	71.5	36.2	10.4	22.3	0.52
3	12.03.2022	80.3	41.2	12.5	24.9	0.57
4	14.03.2022	95.9	46.7	14.9	21.5	0.62
5	17.03.2022	80.7	26.8	12.4	25.3	0.59
6	21.03.2022	56.8	29.4	14.5	24.9	0.61
7	25.03.2022	74.4	36.8	9.4	22.3	0.53
8	28.03.2022	86.8	39.2	12.2	25.1	0.56
9	02.04.2022	92.3	49.8	14.3	23.9	0.68
10	05.04.2022	72.6	50.9	12.4	25.4	0.61
11	09.04.2022	94.9	47.2	13.8	22.4	0.62
12	12.04.2022	89.4	42.8	10.5	24.8	0.69
13	16.04.2022	78.2	39.1	9.7	23.4	0.55
14	19.04.2022	65.2	36.5	13.8	24.9	0.67
15	23.04.2022	79.5	51.2	10.7	24.3	0.53
16	26.04.2022	64.8	34.6	8.8	21.5	0.50
17	30.04.2022	52.5	24.3	9.1	19.5	0.54
18	02.05.2022	86.9	38.9	8.8	22.3	0.53
19	07.05.2022	83.6	49.2	10.5	25.6	0.58
20	12.05.2022	67.9	50.3	12.6	23.7	0.68
21	15.05.2022	88.7	26.7	13.5	25.1	0.65
22	23.05.2022	80.8	40.2	9.8	24.6	0.58
23	25.05.2022	75.6	49.2	14.9	26.3	0.62
24	28.05.2022	84.6	34.3	8.9	17.8	0.45

Near Jala Dhulagori						AAQ-2
S.No.	Date	PM10 (µg/m3)	PM2.5 (µg/m3)	SO2 (µg/m3)	NOx (µg/m3)	CO (mg/m3)
1	01.03.2021	73.6	36.5	7.7	12.5	0.36
2	04.03.2021	56.8	55.8	8.1	13.9	0.40
3	08.03.2021	83.4	39.6	7.2	14.5	0.41
4	12.03.2021	74.3	35.9	9.3	17.5	0.44
5	15.03.2021	58.6	46.2	7.2	15.6	0.39
6	19.03.2021	91.8	49.5	8.0	18.3	0.36
7	22.03.2021	58.6	40.3	9.0	14.5	0.41
8	26.03.2021	87.6	43.8	7.6	15.3	0.39
9	05.04.2021	91.1	53.8	6.7	16.3	0.34
10	06.04.2021	68.6	28.8	9.6	18.5	0.43

11	12.04.2021	56.1	29.5	7.7	15.2	0.34
12	13.04.2021	69.4	35.8	9.8	18.9	0.48
13	19.04.2021	78.6	31.5	7.9	14.5	0.43
14	20.04.2021	90.1	54.9	9.4	15.3	0.39
15	26.04.2021	81.6	42.5	7.7	12.1	0.41
16	27.04.2021	72.4	35.8	9.5	16.8	0.45
17	03.05.2021	89.5	42.9	9.9	19.1	0.41
18	04.05.2021	85.6	36.7	6.4	12.6	0.34
19	10.05.2021	63.8	24.3	7.4	16.4	0.46
20	11.05.2021	58.1	51.6	7.2	13.5	0.42
21	17.05.2021	73.2	39.9	6.8	16.7	0.41
22	18.05.2021	88.6	51.6	7.4	17.5	0.39
23	15.05.2021	69.5	35.7	7.7	18.2	0.42
24	29.05.2021	76.9	38.5	9.6	17.9	0.56

1 Km from Project Site near Ghoraghat						AAQ-3
S.No.	Date	PM10 (µg/m3)	PM2.5 (µg/m3)	SO2 (µg/m3)	NOx (µg/m3)	CO (mg/m3)
1	05.03.2022	86.9	39.5	8.1	12.7	0.38
2	07.03.2022	72.5	29.7	8.5	14.1	0.42
3	12.03.2022	96.8	57.1	7.6	14.7	0.43
4	14.03.2022	64.3	34.5	9.7	17.7	0.48
5	17.03.2022	76.9	29.7	7.6	15.8	0.39
6	21.03.2022	68.1	43.8	9.7	18.6	0.38
7	25.03.2022	58.6	43.5	9.1	14.8	0.45
8	28.03.2022	76.8	25.1	7.8	15.6	0.43
9	02.04.2022	78.4	35.9	7.2	16.6	0.38
10	05.04.2022	86.9	56.9	10.1	18.8	0.46
11	09.04.2022	67.6	44.6	8.3	15.5	0.36
12	12.04.2022	80.6	50.3	10.2	19.2	0.52
13	16.04.2022	94.2	57.7	8.3	14.8	0.48
14	19.04.2022	87.9	53.9	9.7	15.6	0.42
15	23.04.2022	78.4	49.7	8.2	12.4	0.44
16	26.04.2022	94.8	54.2	9.9	17.1	0.49
17	30.04.2022	85.4	39.7	10.3	19.4	0.42
18	02.05.2022	73.5	42.5	6.9	12.9	0.57
19	07.05.2022	89.3	55.8	7.8	16.7	0.49
20	12.05.2022	68.9	29.4	7.5	13.8	0.52
21	15.05.2022	87.9	39.8	7.2	17.0	0.53
22	23.05.2022	66.2	34.2	7.8	17.8	0.49
23	25.05.2022	95.6	56.8	8.2	18.5	0.53
24	28.05.2022	74.5	42.6	9.8	18.2	0.58

New Saranga	AAQ-4
-------------	-------

S.No.	Date	PM10 (µg/m3)	PM2.5 (µg/m3)	SO2 (µg/m3)	NOx (µg/m3)	CO (mg/m3)
1	03-01-2022	67.4	38.6	7.3	9.5	0.33
2	05-01-2022	72.6	40.2	8.2	13.2	0.26
3	10-01-2022	76.8	42.9	7.8	10.5	0.32
4	13-01-2022	56.7	24.6	7.7	12.6	0.31
5	17-01-2022	85.6	48.9	7.2	11.2	0.34
6	19-01-2022	73.9	36.8	7.9	13.4	0.43
7	24-01-2022	65.8	28.4	8.8	12.1	0.36
8	27-01-2022	75.9	51.8	7.5	10.7	0.28
9	03-02-2022	71.8	46.7	7.7	13.4	0.35
10	07-02-2022	59.5	39.8	7.4	12.5	0.26
11	10-02-2022	85.4	24.1	7.6	13.2	0.34
12	11-02-2022	84.1	46.8	7.6	11.5	0.33
13	17-02-2022	70.2	38.2	8.7	11.9	0.29
14	19-02-2022	50.9	41.9	7.8	11.2	0.31
15	24-02-2022	75.6	22.6	8.4	12.3	0.36
16	26-02-2022	69.4	50.2	7.3	11.9	0.31
17	03-03-2022	63.1	34.2	6.9	10.4	0.29
18	05-03-2022	58.7	30.9	7.7	9.5	0.33
19	09-03-2022	63.4	40.1	8.2	11.9	0.31
20	11-03-2022	68.4	45.6	7.9	10.2	0.34
21	17-03-2022	76.8	41.3	8.3	12.1	0.27
22	19-03-2022	72.9	38.6	7.8	13.2	0.33
23	24-03-2022	87.8	43.5	7.6	12.8	0.42
24	29-03-2022	66.2	36.4	7.4	11.1	0.28

Debalpur						AAQ-5
S.No.	Date	PM10 (µg/m3)	PM2.5 (µg/m3)	SO2 (µg/m3)	NOx (µg/m3)	CO (mg/m3)
1	05.03.2022	65.4	36.6	6.3	10.5	0.33
2	07.03.2022	70.6	38.2	8.9	11.3	0.26
3	12.03.2022	74.8	40.9	6.8	9.6	0.32
4	14.03.2022	54.7	22.6	7.3	12.4	0.35
5	17.03.2022	82.9	44.9	8.0	13.3	0.31
6	21.03.2022	73.4	34.8	6.9	11.5	0.34
7	25.03.2022	66.8	26.4	7.3	12.9	0.36
8	28.03.2022	73.9	48.6	6.2	10.5	0.27
9	02.04.2022	69.8	44.7	6.8	9.2	0.35
10	05.04.2022	57.5	37.8	5.9	9.7	0.28
11	09.04.2022	82.6	22.1	6.2	9.8	0.34
12	12.04.2022	79.5	44.8	8.9	9.3	0.33
13	16.04.2022	68.2	36.2	6.3	10.3	0.42
14	19.04.2022	47.8	39.9	7.6	9.3	0.31
15	23.04.2022	73.6	20.6	8.1	9.8	0.35

16	26.04.2022	67.4	48.2	6.4	12.1	0.31
17	30.04.2022	61.1	32.2	8.5	12.3	0.29
18	02.05.2022	59.5	28.9	7.2	10.6	0.33
19	07.05.2022	61.4	38.1	7.5	10.3	0.25
20	12.05.2022	66.4	43.6	5.7	10.9	0.34
21	15.05.2022	74.8	39.3	6.6	12.3	0.27
22	23.05.2022	70.9	36.6	7.7	12.8	0.33
23	25.05.2022	80.2	41.5	6.3	11.4	0.31
24	28.05.2022	64.2	34.4	7.9	10.1	0.28

Jalan Industrial Complex						AAQ-6
S.No.	Date	PM10 (µg/m3)	PM2.5 (µg/m3)	SO2 (µg/m3)	NOx (µg/m3)	CO (mg/m3)
1	05-01-2022	76.5	33.6	10.4	20.1	0.43
2	08-01-2022	89.7	40.2	11.1	27.3	0.52
3	12-01-2022	103.2	47.3	13.2	22.9	0.57
4	14-01-1900	114.6	55.4	14.3	26.4	0.62
5	19-01-2022	99.5	44.9	13.1	23.3	0.59
6	22-01-2022	115.2	52.3	12.4	24.9	0.70
7	25-01-2022	95.8	43.1	10.1	20.3	0.53
8	29-01-2022	89.5	41.2	12.9	23.1	0.56
9	05-02-2022	112.3	52.5	14.8	26.1	0.68
10	08-02-2022	104.6	56.2	13.6	21.6	0.78
11	12-02-2022	107.3	49.3	14.5	25.4	0.62
12	16-02-2022	98.7	45.2	12.4	22.8	0.69
13	19-02-2022	89.6	41.5	10.4	21.4	0.55
14	21-02-2022	110.5	53.9	14.5	26.9	0.67
15	24-02-2022	82.6	40.6	11.4	22.3	0.53
16	27/02/2022	96.8	45.3	10.9	19.5	0.50
17	05-03-2022	57.9	30.5	8.8	21.5	0.71
18	07-03-2022	88.6	40.2	10.6	20.3	0.53
19	12-03-2022	94.2	45.6	11.2	23.6	0.58
20	15-03-2022	117.8	55.5	14.9	25.1	0.71
21	19-03-2022	111.2	51.2	14.2	27.3	0.65
22	21-03-2022	97.8	46.6	11.3	23.1	0.58
23	26-03-2022	109.3	56.2	13.5	25.6	0.70
24	29-03-2022	98	46.4	12.6	18.7	0.45

Bhagwatipur						AAQ-7
S.No.	Date	PM10 (µg/m3)	PM2.5 (µg/m3)	SO2 (µg/m3)	NOx (µg/m3)	CO (mg/m3)
1	03-01-2022	65.4	36.6	9.3	18.2	0.43
2	05-01-2022	70.6	38.2	6.4	21.3	0.51
3	10-01-2022	74.8	40.9	7.3	23.9	0.56

4	13-01-2022	54.7	22.6	8.6	24.1	0.61
5	17-01-2022	80.7	43.2	9.4	22.7	0.58
6	19-01-2022	73.4	34.8	6.8	20.6	0.41
7	24-01-2022	66.8	26.4	8.8	21.3	0.52
8	27-01-2022	73.9	42.1	7.4	24.1	0.55
9	03-02-2022	69.8	40.9	9.8	22.3	0.51
10	07-02-2022	57.5	37.8	7.3	19.2	0.41
11	10-02-2022	76.9	19.2	8.2	23.8	0.48
12	11-02-2022	79.5	41.8	9.9	22.4	0.52
13	17-02-2022	68.2	36.2	9.3	21.6	0.54
14	19-02-2022	47.8	30.5	8.6	20.1	0.56
15	24-02-2022	76.4	20.8	9.9	23.3	0.36
16	26-02-2022	67.4	32.1	7.9	20.5	0.49
17	03-03-2022	61.1	34.5	8.6	16.2	0.53
18	05-03-2022	59.5	28.9	9.8	21.3	0.52
19	09-03-2022	65.6	38.1	8.4	24.2	0.57
20	11-03-2022	66.4	43.5	8.6	19.8	0.43
21	17-03-2022	74.8	39.3	9.9	21.7	0.64
22	19-03-2022	70.9	36.6	7.4	22.8	0.57
23	24-03-2022	80.2	41.5	8.8	20.6	0.42
24	29-03-2022	64.2	34.4	7.6	19.2	0.44

Sarathpalli						AAQ-8
S.No.	Date	PM10 (µg/m3)	PM2.5 (µg/m3)	SO2 (µg/m3)	NOx (µg/m3)	CO (mg/m3)
1	03.03.2021	63.4	34.6	7.5	10.5	0.31
2	05.03.2021	68.6	36.2	7.2	9.1	0.35
3	10.03.2021	72.8	38.9	6.6	10.6	0.36
4	14.03.2021	52.7	20.6	8.1	12.5	0.39
5	17.03.2021	77.9	42.9	7.5	11.2	0.32
6	21.03.2021	71.4	32.8	6.9	10.6	0.28
7	24.03.2021	64.8	24.4	8.6	11.9	0.36
8	31.03.2021	71.9	40.1	7.3	10.2	0.34
9	01.04.2021	67.8	38.9	6.7	9.2	0.26
10	07.04.2021	55.5	35.8	7.2	10.5	0.31
11	09.04.2021	74.9	17.7	6.9	11.4	0.36
12	14.04.2021	77.5	39.8	7.8	12.9	0.39
13	19.04.2021	66.2	36.4	8.3	15.4	0.41
14	21.04.2021	45.8	28.5	6.8	9.8	0.37
15	26.04.2021	74.4	23.5	10.2	12.1	0.31
16	28.04.2021	65.4	36.7	7.1	14.3	0.40
17	30.04.2021	57.3	32.5	6.8	9.3	0.36
18	04.05.2021	57.5	26.9	7.6	10.5	0.28
19	06.05.2021	63.6	36.1	7.2	12.6	0.34
20	12.05.2021	64.4	41.5	6.9	11.5	0.29
21	16.05.2021	72.8	37.3	7.3	13.8	0.36
22	20.05.2021	68.9	34.6	6.8	10.5	0.33

23	24.05.2021	77.6	39.5	10.3	13.0	0.37
24	27.05.2021	62.2	32.4	7.8	12.6	0.41

ANNEXURE-IV : PERMISSION FOR WATER DRAWL

FORM 4

[See Rules 9(3) and 10(5)]

(EMBLEM OR HOLOGRAM OF THE CONCERNED AUTHORITY)

033730**PERMIT FOR SINKING OF NEW WELL**[U/S 7(3)(b) / 7(4)(b) / 7(5)(a) of the West Bengal Ground Water Resources
(Management, Control and Regulation) Act 2005.]PERMIT NO. **PD609002010740000001TLE**

1. (a) Name of the applicant (user)
- (b) Son / Daughter of
- (c) Address of the applicant
- (d) Category of farmer (Please tick)
(in case of irrigation well)
- (e) Serial No. of application Form
and date of submission
- (f) Specimen signature of the user

Shri/Smt. **AMBUJACEMENTS LTD****DHULAGORI, SANKRAIL**

Small Farmer / Marginal Farmer / Others

BP/A, 0154, S.L.No. 1, 2-3-2011**Arum Jhu**

2. Location particulars---

- (a) District
- (b) Block, Mouza, J. L. No., Plot No.
- (c) Municipality / Corporation
Ward No. / Borough No., Holding No.

**HOWRAH
SANKRAIL, SALADHULAGORI,
002, 1074****N.A.**

3. Particulars of the proposed well and pumping device---

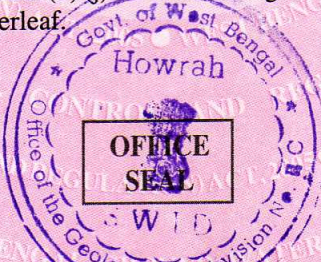
- (a) Type of the well
- (b) Approx. depth of the well (m)
- (c) Purpose of the well
- (d) Assembly size (for tube well)
- (e) Approx. strainer length (for tube well)
- (f) Diameter (for dug well)
- (g) Type of pump to be used
- (h) H. P. of the pump
- (i) Operational device
- (j) Rate of withdrawal (m³/hr.)
- (k) Maximum allowable running hours per day

TUBEWELL**250 mtrs.****Industrial****200 mm. X 200 mm.****30 m.****— m.****SUBMERSIBLE****5.0 H.P.****ELECTRIC MOTOR****30 m³/hr****6 hr/day**

This permit authorizes the owner applicant (user) to sink a well in the location specified at S1. (2) for extraction of ground water at a rate not exceeding that as shown at S1. (3) (j) and for running hours / day as shown at S1. (3) (K), and is valid subject to the observance of the conditions stated overleaf.

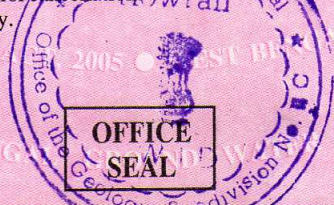
Place : **HOWRAH**Date : **21/6/2011****Conditions :**

- (1) In case of any change of ownership of the proposed well, fresh registration has to be obtained.
- (2) No change of location, design, rate of withdrawal and pumping device in respect of the proposed well as indicated at S1. (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this permit.
- (3) In case, any of the particulars / information furnished by the applicant in his application for issuance of this permit is found to be incorrect during verification at any subsequent stage, this permit is liable for cancellation.
- (4) Any other condition imposed by the concerned Authority.



Signature of the Issuing Authority and Designation.
21/6/2011

**Member Secretary
Howrah District
Ground Water Resources
Competent Authority
Govt. of W.B.**



FORM 4

[See Rules 9(3) and 10(5)]

(EMBLEM OR HOLOGRAM OF THE CONCERNED AUTHORITY)

033739

PERMIT FOR SINKING OF NEW WELL

[U/S 7(3)(b) / 7(4)(b) / 7(5)(a) of the West Bengal Ground Water Resources (Management, Control and Regulation) Act 2005.]

PERMIT NO P060900201963 000000ITSE

1. (a) Name of the applicant (user)
- (b) Son / Daughter of
- (c) Address of the applicant
- (d) Category of farmer (Please tick)
(in case of irrigation well)
- (e) Serial No. of application Form
and date of submission
- (f) Specimen signature of the user



Shri/Smt. M/S AMBUTA CEMENTS LTD.

N.A.

Dhulagori, Bankrail; Howrah

Small Farmer / Marginal Farmer / Others

BP/A0154; 81-3 dt. 6⁹/₁₁

Arum Jh

2. Location particulars---

- (a) District
- (b) Block, Mouza, J. L. No., Plot No.
- (c) Municipality / Corporation
Ward No. / Borough No., Holding No.

Howrah

Bankrail / Taladulagori / 002

Plot - 1963

3. Particulars of the proposed well and pumping device---

- (a) Type of the well
- (b) Approx. depth of the well (m)
- (c) Purpose of the well
- (d) Assembly size (for tube well)
- (e) Approx. strainer length (for tube well)
- (f) Diameter (for dug well)
- (g) Type of pump to be used
- (h) H. P. of the pump
- (i) Operational device
- (j) Rate of withdrawal (m³/hr.)
- (k) Maximum allowable running hours per day

Tube Well

250m

Domestic

127 mm. X 76.2 mm.

18 m.

m.

Submersible

3.5 H.P.

Electric Motor

15 m³/hr.

6 hrs/day

This permit authorizes the owner applicant (user) to sink a well in the location specified at S1. (2) for extraction of ground water at a rate not exceeding that as shown at S1. (3) (j) and for running hours / day as shown at S1. (3) (K), and is valid subject to the observance of the conditions stated overleaf.

Place: Howrah

Date: 13/2/12

OFFICE
SEAL

Chinnaji Roy

Signature of the Issuing Authority
and Designation.

Member Secretary
Ground Water Resources
Development Authority

Conditions:

- (1) In case of any change of ownership of the proposed well, fresh registration has to be obtained.
- (2) No change of location, design, rate of withdrawal and pumping device in respect of the proposed well as indicated at S1. (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this permit.
- (3) In case, any of the particulars / information furnished by the applicant in his application for issuance of this permit is found to be incorrect during verification at any subsequent stage, this permit is liable for cancellation.
- (4) Any other condition imposed by the concerned Authority.

OFFICE
SEAL

It is resolved that mandatory recharge structures in the Complex should be done
Choy