Project Description for Scoping

ACIC Cement Plant and Quarry Operation Expansion Project

Barangay Baha and Barangay Talibayog, Calatagan, Batangas

1.

Submitted to:
EMB Central Office

Submitted by:
Advantage Concrete Industries Corp.
(formerly Asturias Industries, Inc.)

January 2022

An Environmental Report By:

LCI ENVI CORPORATION

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1.0 PROJECT BACKGROUND

1 In 2019, the **Advantage Concrete Industries Corp.** (formerly Asturias Industries, Inc.) was granted with an Environmental Compliance Certificate (ECC Ref No. ECC-CO-1903-0010) for the operation of cement plant complex with quarry in Sitio Punta in Brgy. Baha and Brgy. Talibayog, Calatagan, Batangas. The ECC covers (1) the quarry operation with annual extraction rates of 4.80 million metric tons (MMT) of limestone and 0.88 MMT of shale within the 250-hectare area of MPSA No. 071-97-IV and (2) the cement plant operation with maximum annual clinker production of 3.0 MMT to produce a maximum of 5.0 MMT of cement products within the 22-ha area located inside the Asturias Agro-Industrial Park.

2 As of this writing, the company is currently conducting site grading and geotechnical studies in preparation for the upcoming civil works.

3 **Advantage Concrete Industries Corp.** is applying for an ECC amendment due to the following reasons:

- **Expansion of kiln capacity of two lines.** The output of the respective kilns of lines 1 and 2 will be upgraded from 5,000 TPD to 6,000 TPD each.
- **Area expansion of cement plant.** Given the expansion of clinker and cement capacity, the cement plant will expand from 22 hectares to 120 hectares.
- **To comply with requirements of financial institutions.** The board of investors is expecting clinker output of 12 MMTPY and cement output of up to 20 MMTPY. As a result, Advantage opted to increase the capacity of its cement production from 5.0 MMTPY to 20 MMTPY.

4 To supply the increasing demand of cement in the country, Advantage intends to increase its clinker production capacity to 12.0 MMTPY and cement production capacity to 20 MMTPY. The proponent will construct six lines of cement plant with clinker capacity of 2.0 MMTPY per line. The expansion of the cement plant will be within a 120-hectare area that already includes buffer zones. The shale quarry area will be expanded as well by assigning a shale/pozzolan quarry parcel (221 hectares) to support Shale Quarry 1 (88 hectares) and Shale Quarry 2 (41 hectares). The existing 224-hectare limestone quarry shall remain the same.

5 The proponent also proposes to increase the annual extraction rate of limestone and shale to 19.2 MMTPY and 3.6 MMTPY, respectively. This is to supply the additional raw material requirements of the expansion of the cement plant. The expansion of the quarry operations will utilize MPSA No. 071-97-IV. The quarry area will be within a 574-hectare area within the MPSA.

6 **Table 1-1** shows the details of the project, the Proponent, and the EIA preparer.

Table 1-1: Proposed Project, Proponent and EIA Preparer Details

Project Name	Advantage Concrete Industries Corp. Cement Plant and Quarry Operation Expansion Project		
Project Location	Sitio Punta, Brgy. Baha and Brgy. Talibayog, Municipality of Calatagan, Batangas, Region IV-A		
Type of Project	Mining and Cement Plant Project		
Existing ECC	ECC-CO-1903-0010 granted on July 2, 2019 by EMB-Central Office		
Project Size	**Existing (as per ECC)**	**Proposed Additional**	**Total**
	Cement Plant Operation		
	3.0 MMTPY Clinker Production/ 5.0 MMTPY Cement Production	9.0 MMTPY Clinker Production/ 15.0 MMTPY Cement Production	**12.0 MMTPY Clinker Production/ 20.0 MMTPY Cement Production**
	Quarry Operation		
	4.8 MMTPY limestone	14.4 MMTPY limestone	**19.2 MMTPY limestone**
	0.88 MMTPY shale	2.72 MMTPY shale	**3.6 MMTPY shale**
Project Area	**Cement Plant: 120 hectares including buffer zones**		
	Quarry Areas: - Limestone Quarry: 224 hectares - Shale Quarry 1: 88 hectares - Shale Quarry 2: 41 hectares - Shale/Pozzolan Quarry: 221 hectares		
Project Proponent	**Advantage Concrete Industries Corp.** (formerly Asturias Industries, Inc.)		
Proponent Authorized Representative	Mr. Freddie P. Yumang Authorized Representative 153 EDSA, Barangay Wack-Wack, Mandaluyong City Tel. Nos.: (+63-2) 7267016 / (+63-2)-7261969		
EIA Report Preparer	LCI Envi Corporation Engr. Jose Marie U. Lim EIA Team Leader Unit 8L-M Future Point Plaza 3 111 Panay Avenue, South Triangle, Quezon City Tel No.: (+63-2) 8442-2830, Fax No.: (+63-2) 8961-9226		

2.0 PROJECT LOCATION AND AREA

2.1 PROJECT AREA

7 The project site (quarry and cement plant complex) is located inside the Asturias Agro-Industrial Park in Sitio Punta, Barangays Baha and Talibayog, Municipality of Calatagan, Batangas, Region IV.

8 The proposed project area of the cement plant complex will be expanded from 22 hectares to 120 hectares.

9 The quarry operation will utilize MPSA 071-97-IV that has total land area of 2,337 hectares. Out of the given area, Advantage will use approximately 574 hectares for its limestone and shale quarries.

2.2 PROJECT LOCATION

10 **Figure 2-1** shows the general location map of the project's MPSA area coverage and the location of cement plant complex and quarry areas.

11 The geographic coordinates defining the boundary of the proposed cement complex are provided in **Table 2-1**.

Table 2-1: Geographic Coordinates of the Proposed Cement Plant Complex

Point	Latitude	Longitude
Proposed Cement Plant Complex with ECC: 22 hectares		
1	13°52'28.24"N	120°42'20.86"E
2	13°52'33.43"N	120°42'27.13"E
3	13°52'6.00"N	120°42'40.46"E
4	13°52'12.42"N	120°42'46.17"E
Proposed Expansion of Cement Plant Complex: 120 hectares		
1	13°52'26.14"N	120°42'20.20"E
2	13°52'27.64"N	120°42'23.93"E
3	13°52'14.37"N	120°42'32.18"E
4	13°52'10.87"N	120°42'28.02"E

12 **Table 2-2** shows the geographic coordinates of the quarry areas.

Table 2-2: Geographic Coordinates of the Proposed Quarry Area with ECC

POINT	LATITUDE (N)	LONGITUDE (E)
Limestone Quarry: 224 hectares		
1	13°52'14.60"N	120°41'28.73"E
2	13°52'27.70"N	120°41'38.69"E
3	13°51'15.35"N	120°43'8.26"E
4	13°50'56.94"N	120°43'6.67"E
5	13°51'4.97"N	120°42'43.94"E
6	13°51'29.34"N	120°42'10.75"E
7	13°51'46.60"N	120°42'8.45"E
8	13°51'57.93"N	120°41'52.06"E
9	13°51'57.32"N	120°41'42.80"E

POINT	LATITUDE (N)	LONGITUDE (E)
10	13°52'6.43"N	120°41'33.96"E
Shale Quarry 1: 88 hectares		
1	13°53'12.28"N	120°41'9.89"E
2	13°52'58.74"N	120°41'8.86"E
3	13°52'35.66"N	120°41'25.96"E
4	13°52'36.80"N	120°41'41.99"E
5	13°53'11.06"N	120°41'40.62"E
Shale Quarry 2: 41 hectares		
1	13°51'32.11"N	120°42'45.45"E
2	13°51'14.35"N	120°43'8.83"E
3	13°51'33.57"N	120°43'14.44"E
4	13°51'44.19"N	120°42'54.90"E
Shale/Pozzolan Quarry: 221 hectares		
1	120° 40’ 32.927” E	13° 53’ 11.087” N
2	120° 40’ 32.486” E	13° 53’ 55.243” N
3	120° 41’ 26.587” E	13° 53’ 55.756” N
4	120° 41’ 27.024” E	13° 53’ 11.600” N

2.3 ACCESSIBILITY OF THE PROPOSED PROJECT SITE

[13] Since the project is more proximate to the Municipality of Balayan, with aerial distance of 12 kilometers from the site, compared to the Poblacion of Calatagan, the site is more conveniently reached via one and a half drive from Balayan passing through the barangay road connecting Dali and Talibayog. Balayan, on the other hand, is approximately 118 kilometers from Manila, which takes around 2 hours of land travel.

2.4 VICINITY AND IMPACT AREA

[14] The proposed **Project** is in an industrial area, as indicated in the municipality’s latest land-use map (2017). It is surrounded mostly by vegetation.

[15] The Project Site is bounded by Barangay Luksuhin in the West, Balayan Bay in the East, Mt. Pintong Itim in Barangay Palikpikan in the North, and Barangay Hukay and Pagaspas Bay in the South.

[16] The direct impact areas include the area to be occupied by the proposed cement plant complex, the quarry sites and the nearby communities that will be directly affected by the project. The proposed route of the trucks, heavy equipment and other vehicles that will be utilized for plant and quarry operations will also be included as direct impact area. **Figure 2-2** shows the coverage of the direct and indirect impact areas of the Project. The project impact area includes:

- For the Land component, the direct impact area (DIA) pertains to the areas that will be cleared and developed for the construction and operation of the proposed project components, which are identified in Section 4.

- For the Water component, the DIA refers to the water source in the project site that will be tapped to supply the service water requirement of the project and may be affected by the proposed project activities. It also includes the nearby coastal water where the pier facility that will be used during the operation of the cement plant will be located.

- For the Air component, the DIA covers the areas within the host barangays of Baha and Talibayog where the ground-level concentrations (GLC) of particulate and gaseous emissions, may increase due to the project.

- For the People component, the IIA encompasses the communities in the host Municipality of Calatagan, particularly Brgy. Talibayog which are expected to benefit from the employment, business opportunities, taxes, and other potential socio-economic contributions of the project. It must be noted that all residents of Barangay Baha are already relocated to other barangays in Calatagan.

Figure 2-1: General Location Map

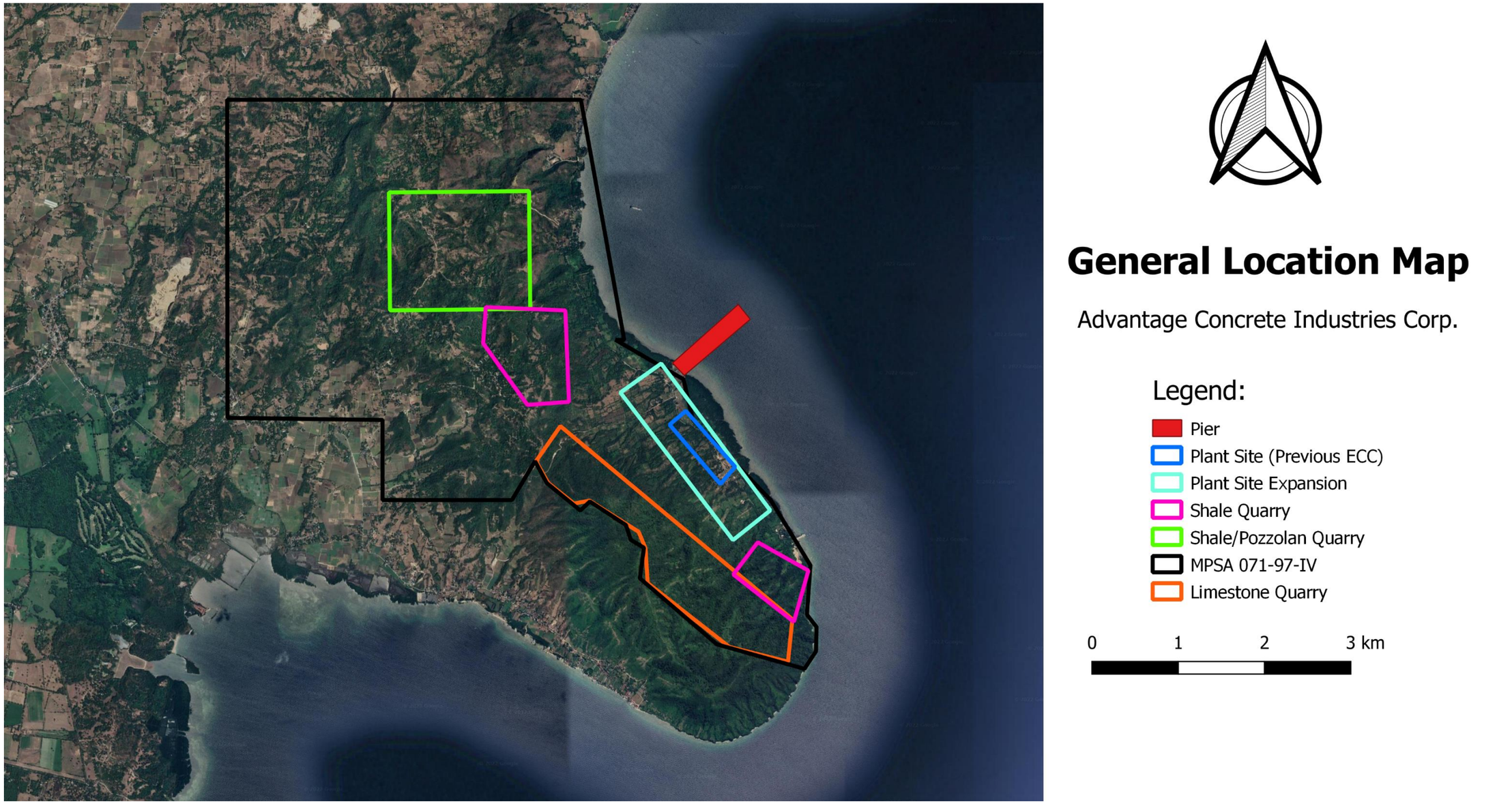

FIGURE TITLE: General Location Map		
PROJECT PROPONENT: **ADVANTAGE CONCRETE INDUSTRIES CORP.** **(formerly Asturias Industries, Inc.)**	NAME OF PROJECT: **Cement Plant and Quarry Operation Expansion Project** *Brgy. Baha and Brgy. Talibayog, Calatagan, Batangas*	EIA PREPARER: **LCI ENVI CORPORATION**

Figure 2-2: Map of the Direct and Indirect Impact Areas

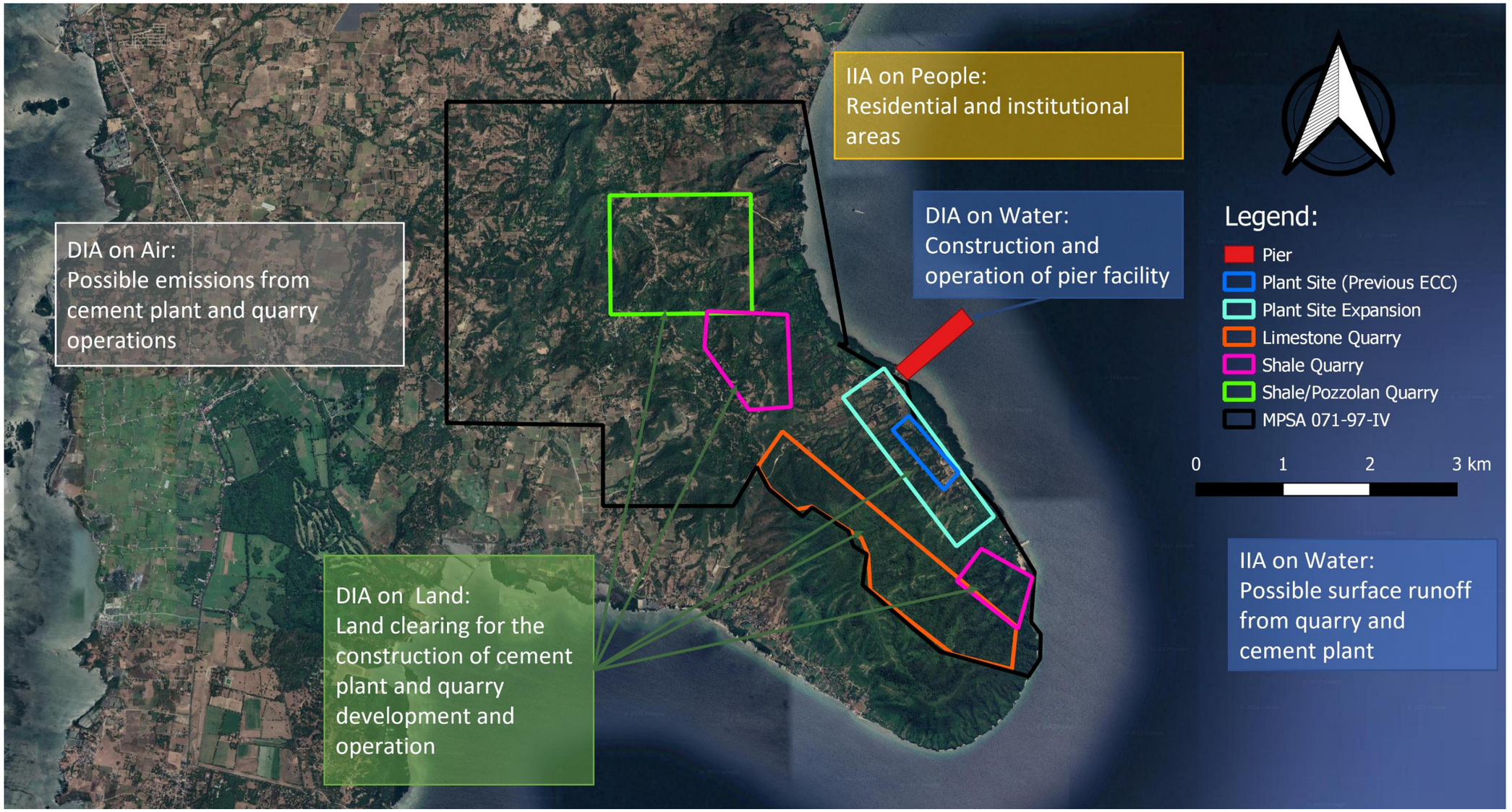

FIGURE TITLE: **Map of the Primary and Secondary Impact Areas**		
PROJECT PROPONENT: **ADVANTAGE CONCRETE INDUSTRIES CORP. (formerly Asturias Industries, Inc.)**	NAME OF PROJECT: **Cement Plant and Quarry Operation Expansion Project** *Brgy. Baha and Brgy. Talibayog, Calatagan, Batangas*	EIA PREPARER: **LCI ENVI CORPORATION**

3.0 PROJECT RATIONALE

[17] The cement manufacturing industry is an essential component in the infrastructure sector of the Philippines. Being an important construction material in infrastructure projects, it is therefore necessary to guarantee its supply while maintaining competitive prices. Cement is almost universal in terms of building applications, both from the public and the private sectors. It has produced many projects in the country, such as low-cost socialized housing, public schools & hospitals, highways, bridges and privately funded endeavors, such as condominiums and other residential and commercial structures.

[18] The supply and demand of cement is often used as an indicator of the country's overall economic situation. When supply of cement is low, prices increase, and importation becomes necessary. In worst case scenarios, this leads to development projects being delayed, downsized or even cancelled. This would impede the construction of basic social services infrastructures and would result to slowing down of the economy and the local cement industry. Hence, to be able to increase the Philippines' cement supply, lower the need for its importation, and guarantee its competitive price; there should be additional establishment of cement production facilities.

[19] This proposed project will not only provide Advantage Concrete Industries Corp. a viable business, but will also contribute to the economic development of Calatagan, specifically Barangay Baha and Talibayog, its neighboring municipality of Balayan, and even improve the economic growth of the entire province of Batangas. The proposed project will contribute to the development of these municipalities by means of job creation, taxes, increased commercial trading, and could perhaps even bring additional investments. Advantage Concrete Industries Corp. shall maintain a socially acceptable and environmentally responsible operation, so as to make the Advantage Concrete Industries Corp. Cement Plant and Quarry Expansion Project important to the lives of the local population and industry.

4.0 PROJECT ALTERNATIVES

4.1 SITE SELECTION

[20] Mining and quarry projects are site specific as dictated by the location of the resources. Unlike other natural resources, there are no alternative sites in developing mineralized areas. The location of ancillary facilities (i.e. processing plants) were determined based on economic, technical, and environmental factors.

[21] Upon selecting the potential sites for the proposed cement plant complex and quarry sites, the following factors persuaded the proponent to choose the site in Barangays Baha and Talibayog as the final project site. The proposed site was chosen for the following reasons:

- Good quality limestone is present in the area;
- The area is accessible from the provincial highways;
- It is approximately 5 kilometers from the national highway;
- The coastal water is deep which is ideal for building a pier;
- The landowners are reasonable to deal with; and
- There are no immediate volcanic hazards in the area.

[22] The proposed project site is already owned by **Advantage Concrete Industries Corp**. The proposed site is known to contain limestone and shale minerals; therefore, it was not practical to select other sites. The zoning of the project site is also suitable for industrial purposes; the project footprint will not be built on agricultural areas.

4.2 TECHNOLOGY SELECTION

[23] Development design factored in the provisions for human health and safety, including 1) the provisions for mining operations as provided by the Mines and Geosciences Bureau for setbacks, and 2) the guidelines to protect people and their sources of livelihood. For example, the provisions are: a) safety factors of equipment to ensure minimizing environmental impact during operations, b) benching method to be employed in limestone quarrying, and c) optimized blasting frequency vs. magnitude of blast.

[24] In terms of technology, **Advantage Concrete Industries Corp**. opts to implement a full cement plant instead of a stand-alone grinding facility since the raw materials for the cement production is already present in the proposed project site.

[25] There are two types of process involved in the cement production; the wet process and the dry process. **Advantage Concrete Industries Corp.** will be using the dry process because of its minimal water requirement. The savings in fuel cost by using the dry process vs the wet process is the compelling reason why modern cement plants use the dry process.

[26] The technology proposed will also involve the recovery of heat from the furnace which will be used internally to save on power requirement.

4.3 RESOURCES AND ALTERNATIVE FUELS

[27] The proponent is committed to improve the cement production in its project by seeking energy efficient processes and sustainable alternative energy sources. They are considering the

use of alternative fuels, which is well proven and well established in most cement industries in Europe and Asia.

[28] Possible alternative fuels that can be used for the proposed cement plant include industrial wastes such as: used tires, rubber, paper waste, waste oils, waste wood and paper sludge. The use of alternative fuels is subject to its availability and to limits on handling. Alternative fuels that are commonly used in the cement industry are used rubber tires. For the production of 1.5 MMTPY of clinker, about 10 to 20 MT of tires per day can reduce 1.8 to 3.6% of the coal usage.

[29] The proponent will submit its technical position on its use of alternative fuels to EMB and secure the necessary permits from appropriate agencies prior to implementation.

[30] The use of waste as alternative fuel in cement production has numerous environmental benefits such as:

- The use of waste will reduce the use of non-renewable fossil fuels, such as coal, and reduce the environmental impacts associated with coal mining. The use of waste as alternative fuel will contribute towards lowering of greenhouse gases emissions by reducing waste materials to be incinerated in municipal waste incinerators.
- The use of waste as alternative fuel is technically sound, since the process basically destroys the organic components and retains the inorganics, such as insoluble residues, ashes and silicates, and integrates these to the product. Cement kilns have a number of characteristics which make them ideal installations for alternative fuels to be vaporized and burnt safely. The following characteristics are high operating temperature, long residence time, presence of oxidizing atmosphere and alkaline environment, high thermal inertia, retention of ash in clinker and the continuous supply of fuel.
- Concrete made from cement manufactured using alternative fuels will have the same properties as concrete made from cement manufactured using fossil fuel as the heavy metal concentrations in concrete are not significantly changed by the use of alternative fuels. It is expected that quantities of leached metals will be immeasurable and significantly below levels allowed for drinking water.

4.4 NO PROJECT OPTION

[31] If the proposed project will not proceed, the existing biophysical, environmental and socio-economic conditions in the project site will remain the same. None of the potential effects of the project, positive or negative, will occur. There will be no increase in the economic activity in the host barangays and municipality and any adverse effect of the project on the existing environment would be avoided. However, the mineral resource present in the project site will not be developed and the resulting socio-economic benefits of Brgy. Baha and Brgy. Talibayog and the Municipality of Calatagan will not occur.

[32] **Advantage Concrete Industries Corp** is committed to contributing to local and national development including care for the environment and sustainable development, by promoting practices that minimize negative impacts on natural resources, and other community values, at the same time acknowledging that mining development and the establishment of the plant can significantly contribute to improvements in local and national quality of life and economic development needs and objectives. Proceeding with the Project is not expected to have

significant negative effects on the biophysical and socio-economic environment due to the implementation of appropriate mitigation measures.

5.0 PROJECT COMPONENTS

[33] The proposed project will include major components for quarry operations and cement production. The project will also include the improvement of existing dirt roads leading to the proposed site. The operation of the cement plant complex will involve the use of the pier facility that will be constructed within the area. **Figure 5-1** shows the plant layout for the proposed six lines of cement plant.

[34] Since explosives will be used for the quarry operation, an explosives storage facility will be constructed based on the guidelines set by the Bureau of Fire Protection (BFP), the Philippine National Police-Firearms and Explosives Division (PNP-FED) and by the DENR AO No. 2000-98 or known as the "Mine Safety and Health Standards". The project shall also include support facilities and pollution control facilities.

[35] **Table 5-1** shows the specifications of structures and facilities to be constructed as part of the quarry and cement plant complex.

Table 5-1: Planned Specifications of Structures and Facilities of the Proposed Cement Plant Complex and Quarry

Project Component	Description/Specifications	
	Existing	***Proposed Expansion***
Quarry Operations (common to all lines)		
Limestone crushing system	1,500-tons per hour (tph) capacity	2 x 2,000-tons per hour (tph) capacity
Clay crusher	400 tph	2 x 1,000 tph
Cement Plant Operations (common to all lines)		
Raw material storage	150,000 MT	
Limestone Storage		300,000 MT
Additive Storage		280,000 MT
Coal Storage		80,000 MT
Stacker	1,500 tph	
Reclaimer	800 tph	
Feed bins for raw grinding	700 MT limestone, 300 MT shale, 350 MT silica, and 100 MT pyrite	6 x 700 MT limestone, 6 x 300 MT shale, 6 x 350 MT silica, and 6 x 100 MT pyrite
Raw mill	400 tph	6 x 500 tph
Homogenizing silo	15,000 MT	6 x 15,000 MT
Kiln system	5,000-TPD clinker	6 x 6,000-TPD clinker
Clinker silo	2 units with capacity of 25,000 MT each and 800 MT for the off-spec clinker storage	6 x 25,000 MT Clinker Silo and 6 x 1500 MT for the off-spec clinker storage
Coal Mill		3 x 100 tph
Feed bins for cement grinding	400 tons Clinker 250 tons limestone 250 tons pozzolan 200 tons gypsum 200 tons fly ash	6 x 400 tons Clinker 6 x 250 tons pozzolan 6 x 250 tons gypsum 6 x 200 tons fly ash

Project Component	**Description/Specifications**	
Cement mill	300-tph	6 x 500-tph
Cement silo	4 units x 15,000-MT	6 x 15,000-MT
Roto packer	4 units x 100 tph	24 x 120 tph
Bulk loading facility	2 loading bays	3 x 15,000-MT Bulk Loading Silos
Waste heat recovery power plant		7.5 MW
Water Source		
Deep well and surface water		
Power Source		
Batangas Electric Cooperative		
Pollution Control Facility, Equipment, and Structures		
Air pollution control	• Bag house filters • Buffer zone	
Wastewater pollution control	• Siltation ponds, sediment traps, erosion barriers, and silt curtains • Wastewater treatment facility • Oil spill management facilities	
Support Facilities		
• Warehouses	• Administration building	
• Medical clinic	• Parking and truck marshalling areas	
• Fire station	• Water treatment facility	
• Access roads	• Water pumps and pipelines facilities	
• Power substation	• Staff and bunk houses	
• Plant nursery	• Motor pool and equipment maintenance facility	
• Explosive magazine	• Solid and hazardous waste management facilities	
• Guest House	• Central Control Room (CCR)/Laboratory Building	
	• Shops Area (Electrical, Machine, and Fabrication)	

Figure 5-1: Proposed Cement Plant Layout

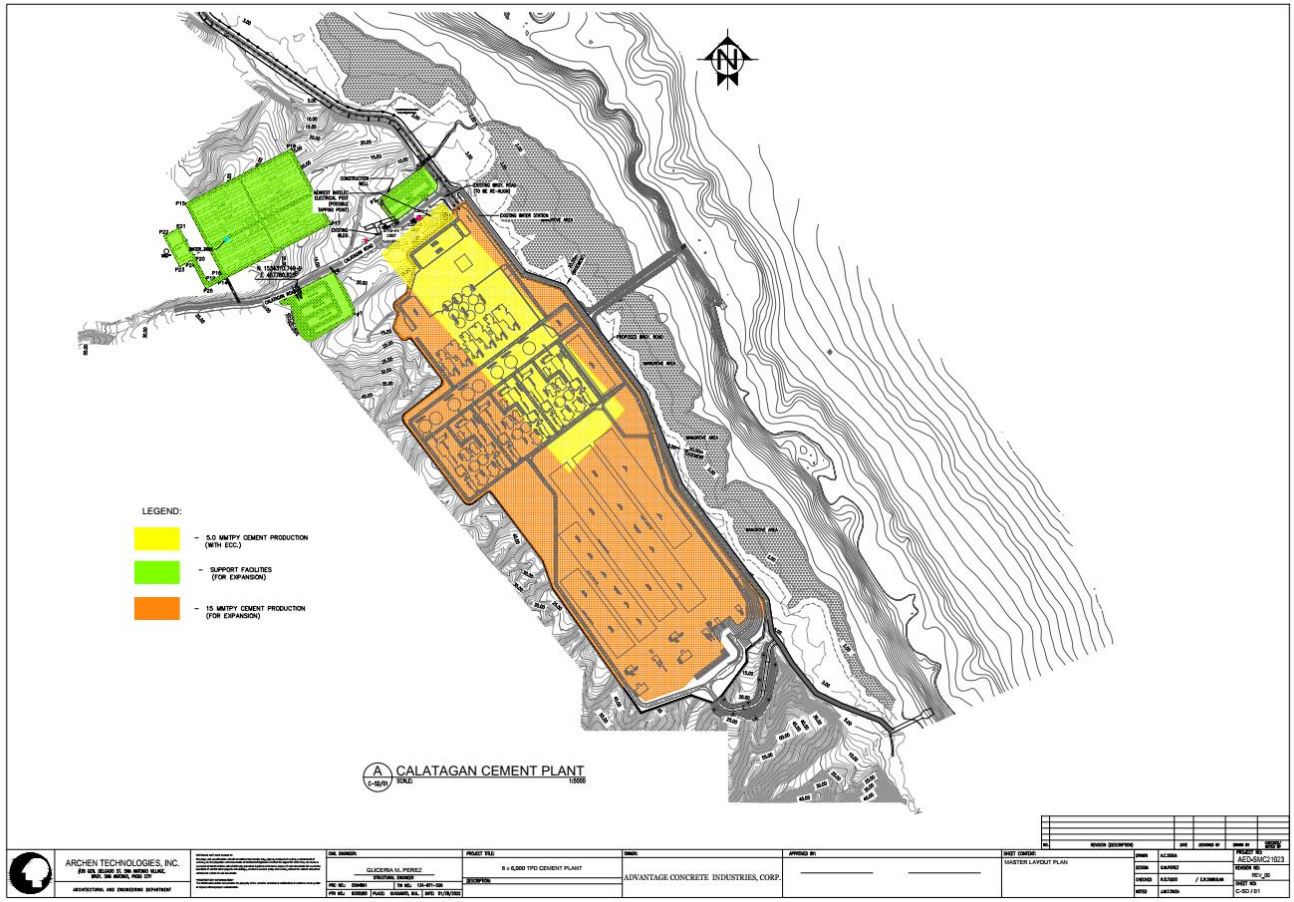

FIGURE TITLE:

Proposed Cement Plant Layout

PROJECT PROPONENT:	NAME OF PROJECT:	EIA PREPARER:
ADVANTAGE CONCRETE INDUSTRIES CORP. (formerly Asturias Industries, Inc.).	Cement Plant and Quarry Operation Expansion Project *Brgy. Baha and Brgy. Talibayog, Calatagan, Batangas*	**LCI ENVI CORPORATION**

5.1 SUPPORT FACILITIES

[36] Warehouses, administration building and staff house, and parking and truck marshalling area will be constructed to support the operation of the cement plant. Medical clinic, fire station and power substation will also be constructed as support facilities. A water treatment facility will also be constructed and used to treat the water to be used during the operation.

[37] The pier facility that will be constructed. This will be used during the operation of the cement plant as means of transportation of the materials and products of the project.

[38] The plant shall build an Explosives Magazine (warehouse/storage facility) to specifically store explosives that will be used in the blasting activities. This facility will be constructed based on the guidelines set by the Bureau of Fire Protection (BFP), the Philippine National Police-Firearms and Explosives Division (PNP-FED) and DAO 2000-98 to primarily decrease the risk of accidental explosion to people and property. The explosive storage facility will have a maximum capacity to store for one month's usage. Physically, the storage room may only be about 10 x 10 meters well-ventilated, locked and secured with a fence all around the room about 5 meters from the walls of the room. The Explosives Magazine shall feature the following items:

- Designed to be fire, blast, and even bullet-resistant;
- The facility will be situated in an isolated zone, away from nearby residents and the main production facility;
- Installed security fences and gates, warning signs, and closed-circuit television;
- No other openings except for the entrance/exit and ventilations;
- All ventilations will be provided with metal screens to prevent unauthorized access;
- The doors will have multiple security locks, which will be kept by a representative of PNP-FED, plant's security officer, and the master blaster;
- Equipped with lightning arrester, wooden matting, anti-static devices, fire extinguishers, and vapor-proof lighting fixtures;
- The immediate surrounding will be cleared with any combustible material; and
- Has separate chambers to contain the stocks of dynamite, blasting caps, fuses, and ammonium nitrate.

5.2 ACCESS ROADS

[39] Two main access roads will be developed for easier access to the project site. One is the existing route from Zobel highway in Calatagan wherein the provincial road will be connected to the barangay road within the project site. This road will be widened and concreted. The second one will the construction of a new road that will connect the Balayan highway to the project site.

[40] These access roads, after full completion, will provide Advantage Concrete Industries Corp**.** a faster and safer means of land travel to the proposed Project's facilities.

[41] The construction of the access roads has an ECC granted by EMB Region IVA (ECC-R4A-1811-0320) as part of the site development project of the industrial park.

5.3 TEMPORARY FACILITIES DURING CONSTRUCTION

[42] To support the construction activities, temporary facilities such as the following will be installed in the project site:

- Temporary protective fencing and lighting;
- Gatehouse and site security facilities;
- Temporary parking space;
- Temporary and secured equipment and material storage areas (i.e. diesel storage area);
- Temporary site office;
- Emergency spill kits;
- First aid stations;
- Temporary solid and hazardous waste storage areas;
- Portable sanitation facilities;
- Diesel storage tanks;
- Generator sets

5.4 POLLUTION CONTROL DEVICES

5.4.1 Air Pollution Control

[43] The priority is to minimize the increase in ambient particulate levels by reducing the mass load emitted from fugitive emissions and from other sources. Collection and recycling of dust is required to improve the efficiency of the operation and to reduce atmospheric emissions.

[44] For control of fugitive particulate emissions, ventilation systems shall be used in conjunction with hoods and enclosures covering transfer points and conveyors. Drop distances shall be minimized using adjustable conveyors. The operations of the air pollution control system are described in the following sections:

- Bag filters are installed at various points in the plant to collect the solid particulates escaping from the system. The bag filters have guaranteed efficiency of 99.99% in eliminating the dust. The bag filters are provided with a fan, driven by an electric motor, to regulate volumetric flow, gas temperature, and static pressure.
- Operating areas which could be dusty, such as the pack house and the additives storage hall will be fully enclosed and provided with dust collectors. Fugitive dusts on the roads will be suppressed with water sprays.
- A green area about 10 meters wide will be constructed along the sides of the plant premises. The green area will be planted with trees of various heights and “thicknesses” to act as dust barrier or dust curtain.

Table 5-2: Air Pollution Sources and Corresponding Air Pollution Control Facility

Air Pollution Control Facility	Air Pollution Source
Bag Filters	• Primary Crusher • Vibrating Screen • Secondary Crusher • Additive Crusher • Transport conveyors • Raw Mill • Homosilo discharge • Kiln Feeding Bin • Clinker Cooler • Clinker Silo • Clinker Silo discharge • Feed bins • Coal Mill • Roller Press • Finish Mill • Top of clinker bin • Cement Silo • Air slide transport • Finish Mill • Bulk Silo • Pack House • Transport Bag Filter • Coal storage facility

5.4.2 Water Pollution Control

[45] Portable toilet facilities will be installed on-site to cater the domestic wastewater that will be generated by the workers. These facilities will be regularly siphoned by DENR-accredited haulers.

[46] Wastewater that will be generated during the operation of the project will be limited to domestic wastewater and surface run—off. A wastewater treatment facility will be constructed in the cement plant complex to treat the domestic wastewater generated by the workers

[47] Siltation ponds will also be constructed on strategic areas within the project site to collect and pre-treat the run-offs that will come from the quarry areas prior to discharging to the drainage. This is to allow the settling and decrease the suspended solids of run-off.

[48] Wastewater from ground surface (from rain and from cleaning) will pass thru a sediment and oil trap before release to existing waterways in the site.

5.4.3 Solid Waste Control

[49] A temporary solid waste storage area will be provided in the site during construction. All solid wastes will be properly segregated and disposed. Designated spoil disposal area will also be provided. All of these will be located inside the project site.

[50] Solid wastes from the office, dormitory/kitchen and other facilities will be segregated as to bio-degradable or not and will be disposed of accordingly with the help of the municipal government.

6.0 PROCESS/TECHNOLOGY

[51] The amount of raw materials that the cement plant will be utilizing to produce 3.0 MMTPY of clinker is summarized in **Table 6-1** and with the additives to produce a maximum cement capacity of up to 5.0 MMTPY**.**

Table 6-1: Raw Material Requirements of the Cement Plant (per line)

Minerals	Mineral Requirement (MTPY)
Limestone	4,800,000
Silica	336,000
Shale	265,000
Pyrite	107,000
Additives (pozzolan, fly ash, high-grade limestone, gypsum)	2,000,000

6.1 QUARRYING

6.1.1 Shale and Limestone Excavation

[52] The excavation of shale and limestone will be done using Air Trac Drill to a desired depth and applying the mining technique called 'benching'. With this method, the overburden, the soil and rocks that are covering the limestone and shale deposits, will be removed by creating a series of step levels or 'staircases', one top of each other. After the quarry has progressed, the mine site will resemble a terraced surface. This procedure reduces the risks of sudden landslides and uncontrolled erosions. The overburden shall be stored in Plant's holding facility, which then will be returned to the mined surfaces after the deposits have been gathered.

[53] The excavated limestones will be transferred to the loading area by a bulldozer. Using a shovel or backhoe, these boulders will be loaded to dump trucks and hauled to the crushers.

[54] **Figure 6-1** shows a diagram of the benching method.

6.1.2 Explosives Blasting

[55] Explosive blasting will be carried out for ore sites that are too difficult to extract by conventional drilling and excavation methods. The explosive force breaks large boulders into smaller and more manageable sizes that can be transported by trucks. This method hastens the ore extraction process, and also decreases the wear and tear on major quarrying equipment.

[56] However, this method of ore extraction will be done in an exceptionally calculated, secured, and carefully handled procedure. To prepare a mine site for blasting, holes will be drilled in the soil, evenly spaced, where the explosives will be placed in. After the explosives are settled, electrical detonators will be placed, and wired to the main control switch. Prior to the blasting, all systems shall be double-checked. When an alarm is already ensued, all personnel near the blast zone must already be evacuated. A duly trained blasting operator, with direct supervision, shall induce an electrical current to detonate the explosives. The explosion will take place in a brief moment. The exposed overburden and ore will be hauled into the main production facility

6.1.3 Limestone Crushing and Conveying

[57] From the quarry site, the extracted limestone will be transported to the crushing system of the plant. The mined limestone is dumped in the receiving hoppers through open trucks; one for low grade limestone and a one for high grade limestone. Using apron feeders, limestone will be fed to the crushers. The limestone will undergo two stages of crushing. Both of the crushing stages will be using single rotor hammer crushers.

6.2 CEMENT PROCESSING

[58] **Figure 6-2** shows in detail the cement production process the plant will be implemented.

6.2.1 Raw Meal Grinding

[59] Limestone and other raw materials will be reduced in size (25 mm sieve size 90%) to approximately less than 10% residue on 88-micron sieve. Vertical roller mill will be used for the raw meal grinding. The mill feed belt conveyor transfers the material into a pneumatic actuated diverter chute, which passes the material either to a collector bin for the removal of tramp metals or to the mill via an appropriate heavy-duty airlock valve.

[60] The raw meal product is transported by means of air slides and bucket elevator to the raw meal homogenizing silo. On the raw mill output, before the raw meal elevator, a continuous sampling device is installed to allow checking of the product quality in the laboratory.

6.2.2 Raw Meal Homogenization

[61] The raw materials will be made to pass through a series of conveyors and reclaimers that will proportion the materials through speed regulation. Once the desired material proportion had been attained, the raw materials are ground to produce raw material mix. In the raw mill, kiln gases will be used to dry the raw mix. The raw mix is then pneumatically conveyed into a large concrete homogenizing silo for thorough blending. The capacity of the homogenizing silo is about 22,000 tons.

6.2.3 Pre-heat Exhaust Gas Treatment

[62] Kiln gas from pre-heater top stage is sucked through down comer by kiln pre-heater fan. After it passes the pre-heater fan, the gas is passes through the raw mill or mill bypass. It then passes to the main bag filter, filter fan, and to main stack. Portion of the kiln gases passes from pre-heater fan to coal mill. The pre-heater fan is equipped with hydrodynamic coupling as variable speed device in order to save power energy. Kiln vent gas is used during compound operation (when raw mill is turned on) for drying of raw material in the raw mill. Depending on the required drying conditions for the raw material, the hot gases flowing to mill will be controlled while portion of the gases are bypassed.

6.2.4 Kiln Feeding System and Pre-heater Tower

[63] The kiln feeding system consists of a string of five staged pre-heater cyclones fitted with a pre-calciner which is fired with ground coal. Co-processing of alternative fuels such as used oil or sludge on the kiln is being planned.

[64] The raw meal is fed into the pre-heater via a bucket elevator. The gas entering the pre-heater passes thru the gas inlet of cyclone 1# or cyclone 2#, which is controlled by an air slide

and rotary valve. Under each rotary valve, slide gates are installed in order to protect them against overheating. Material ducts between the pre-heater stages are equipped with pendulum flaps and splash box. The raw meal enters into the pre-calciner from stage 4. Tertiary air is fed into the sides of the pre-calciner. The pre-calciner ensures a complete combustion of the pulverized coal. The tertiary air comes from the kiln hood. The air quantity is adjusted by the damper installed in the TAD (Tertiary Air Duct). A staircase and a service/good lift for passengers and maintenance (handling of bricks and spare part) are included in the pre-heater structure.

6.2.5 Kiln & Clinker Cooling

65 The raw mix is then fed to the rotary kiln which is 87 meters in length and 5.8 meters in diameter. Inside the kiln, the raw mix is calcined to produce clinker. The clinker is cooled by air quenching in the grate cooler and is then stored before final grinding.

6.2.6 Clinker Transport & Storage

66 An inclined deep pan conveyor will be installed under the clinker cooler crusher discharge, for transporting of the clinker to the clinker silo.

67 This deep pan conveyor will feed a distribution box, which feeds the clinker either to the clinker silo or to off-spec clinker bin via another pan conveyor. The off-spec bin will discharge onto trucks for clinker bulk discharging, or transport to cement feed bin.

68 The clinker silo will have three extraction galleries underneath which will transfer the clinker thru a belt conveyor system to the cement mill clinker bin. All transfer points at this area will still be properly de-dusted by strategically designed bag filters.

6.2.7 Cement Proportioning Station

69 Bins will be installed to store the following: clinker, limestone, pozzolan, and gypsum. Each bin will have a weight belt feeder to measure quantities of materials being fed to the cement grinding system. Materials shall be discharged by proportion and conveyed to the cement grinding system by a belt conveyor.

70 The new bins will be mounted on load cells for exact determination of the filling level. Dust filter will de-dust the top area of the bins and the discharge area. A self-cleaning metal separator (belt magnet) and Metal detector will be installed over the collecting belt.

6.2.8 Cement Grinding

71 The materials will be ground in a vertical roller mill. They will be pulverized as they are crushed in between the four rollers pressing on a rotating table. Hot air is injected from underneath the nozzle ring outside the periphery of the rotating table. This jet of hot air dries the materials and the fine particles are entrained by the gases exiting thru a rotating classifier at the upper portion of the mill body. There is internal recirculation of the particles that could not pass thru the internal classifier. The coarse particles are rejected out of the mill and are re-circulated into the mill for re-grinding. The finer particles pass thru the classifier and are carried by the exit gases that will pass thru a bag filter where the finished cement will be separated by the bags and collected at the bottom of the bag filter and subsequently conveyed into the cement silos. There is internal recirculation of the particles that could not pass thru the internal classifier.

6.2.9 Cement Storage

[72] Cement in the silos are extracted at the bottom by sets of air slides and is conveyed to the bins of the rotary packing machines. Each of the three roto-packers has eight spouts which fill the bags as the machine rotates. The filled bags containing 40 kilograms of cement are conveyed to trucks on where they will be loaded manually.

[73] Cement may also be dispatched in bulk-to-bulk carriers from a separate bulk cement bin thru expandable bellows. Cement may also be dispatched in jumbo bags with 1,000 kilograms net content. The jumbo bag loading facility will be located under the cement silo. Loading of cement into bulk carriers is controlled by the weight of cement already loaded into the bulk carrier

6.3 PROJECT UTILITIES

6.3.1 Power Supply

[74] The power of the proposed project will be sourced from the Batangas Electric Cooperative (BATELCO). The estimated power requirement of the project is about 35 MW per line.

Table 6-2: Estimated Power Consumption of Equipment per Line

Power Consumptions of Equipment	
Department	**Power (kW)**
Raw Mill	5,101.40
Raw Mill 2 Dept.	5,101.40
Raw Meal Blending And Kiln Feed Dept.	724.72
Spray Tower & Bag Filter Dept.	1,907.56
Coal Mill Dept.	2,337.49
Coal Dosing Dept.	533.20
Kiln Dept.	4,027.00
Clinker Cooler Dept.	3,902.00
Finish Mill 4	8,383.66
Silo 4 (Loading and Unloading)	652.80
Compressor	750.00
Water Pump	372.00
Packhouse Dept.	525.48
Total Power	**34,318.71**

6.3.2 Water Supply

[75] The construction of the cement plant complex will require about 400 m^3/day of water. Water for domestic usage of the workers is estimated to be 50 m^3/day which will be sourced from deep wells. The water needed for construction activities i.e., for concrete mixing and cleaning of equipment is approximately 50 m^3/day and will also be supplied by deep wells. To suppress the dust generation during the construction, regular water spraying will be done on-

site. This will require at most 300 m^3 of water day, considering the area of the project site, and will be sourced from the coastal water.

Table 6-3: Water Requirement for the Construction of the Proposed Project

Water Use	Water Requirement (m^3/day)	Water Source	Wastewater Generation (m^3/day)
Domestic	50	Deep Well	~ 40
Concrete mixing and cleaning of equipment	50	Deep Well	-
Dust Suppression	300	Surface Water	-
Total	400		40

[76] The operation of the proposed project will be sourcing its water requirement from deep wells and the coastal water. The water from the deep wells will undergo water treatment prior to the usage.

[77] For the quarry operation, water is needed for the constant watering of the quarry road to lessen the dust emissions. During dry months, 3 watering sessions will be conducted per month which is equivalent to at least 60 m^3 per day while wet season will only require about 20 m^3/day. This will be sourced from the nearby coastal water.

[78] Surface run-off from the quarry and the cement plant will be directed into siltation ponds to allow suspended solids to settle. The desilted water from these ponds will be re-used for road cleaning and watering of plants. In case of overflow (i.e., during heavy rainfall), the siltation ponds will discharge to the nearby coastal water.

Figure 6-1: Diagram of Benching Method in Quarrying

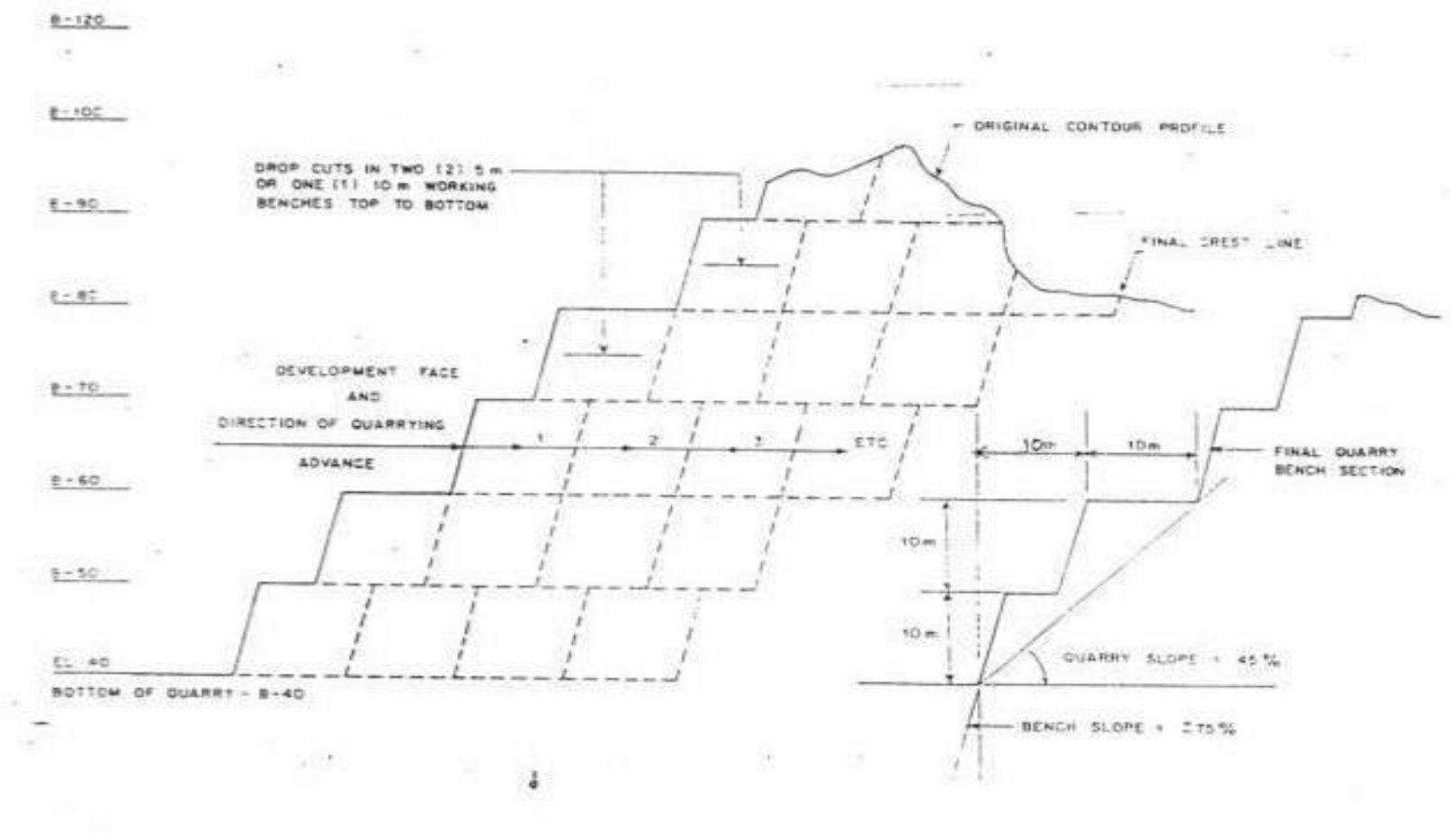

FIGURE TITLE:

Diagram of Benching Method in Quarrying

PROJECT PROPONENT:	PROJECT TITLE & LOCATION:	REPORT PREPARER:
ADVANTAGE CONCRETE INDUSTRIES CORP. **(formerly Asturias Industries, Inc.)**	**Cement Plant and Quarry Operation Expansion Project** Brgy. Baha and Brgy. Talibayog, Calatagan, Batangas	**LCI ENVI CORPORATION**

Figure 6-2: Cement Plant Process

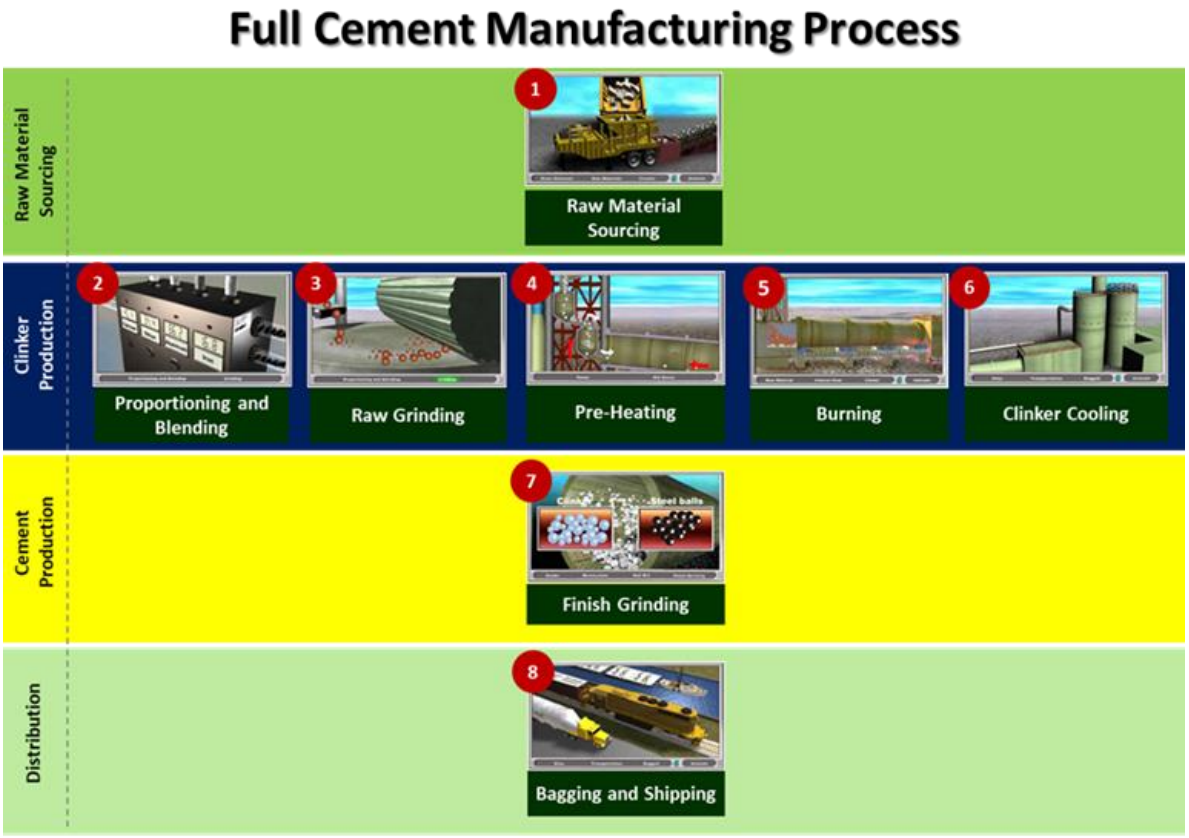

FIGURE TITLE:
Cement Production Process

PROJECT PROPONENT:	PROJECT TITLE & LOCATION:	REPORT PREPARER:
ADVANTAGE CONCRETE INDUSTRIES CORP. (formerly Asturias Industries, Inc.)	**Cement Plant and Quarry Operation Expansion Project** Brgy. Baha and Brgy. Talibayog, Calatagan, Batangas	**LCI ENVI CORPORATION**

7.0 PROJECT SIZE

7.1 CEMENT PLANT CAPACITY

[79] The proposed Cement Plant Complex will have a total capacity of 12.0 MMTPY of clinker or up to a maximum of 20.0 MMTPY cement. It will have six cement lines with 2.0 MMTPY clinker production capacity per line.

7.2 ALLOWABLE QUARRY AREA

[80] The quarry areas of the project are within the property with Mineral Production Sharing Agreement (MPSA) No. of 071-97-IV with aggregate area of 2,337.

[81] The primary minerals that will be extracted from the quarry area are limestone and shale. A total of ~405 million MT of limestone and ~544 million MT of shale are available within MPSA 071-97-IV.

[82] To produce 12.0 MMTPY of clinker, about 19.2 million MT and 3.6 million MT of limestone and shale will be extracted per year, respectively. Mineral requirement for the cement production per line is shown in **Table 7-1.**

Table 7-1: Total Available and Extracted Mineral Reserves for the Proposed Project

Mineral	Total Amount of Reserves Available (MT)
Limestone	405,000,000
Shale	543,863,600

8.0 MANPOWER REQUIREMENT

[83] The proposed project will have different manpower requirements throughout its development phases, as shown in **Table 8-1**. Proponent shall give priority hiring and preference to qualified and competent local residents for employment. Adequate public information for jobs available to local residents in the affected areas shall be provided as well.

Table 8-1: Manpower Requirement per Project Phase

Project Phase	Estimated Manpower Requirement	Tasks to Perform	Skill Requirement
Pre-construction	10 to 20	Complete the feasibility study, detailed engineering design, detailed drawings, permit requirement and tender documents	Specialized technical skills/expertise on various engineering and scientific skills.
Construction	500 to 750	Civil works, architectural, and electro-mechanical works.	• Engineers • Project managers • Skilled and non-skilled laborers
Operation	250 to 300	• Oversee the entire operations of the proposed Project, including emergency situations; Ensuring the safety and welfare of its personnel • Maintain conformity of the proposed Project to relevant government regulations, including tax payments, ECC compliance, etc. • Promote and uphold a harmonious relationship with the host community • Operation of the plant • Quarry operations • Technical expertise on essential departments of the plant • Administrative works • Health / medical staff • Security force	• Management and administrative skills • Overall knowledge on the operation including key environmental, labor, and local ordinances
Abandonment	25 to 50	Implementation of the Abandonment plan	As required

9.0 DEVELOPMENT PLAN, DESCRIPTION OF PROJECT PHASES AND CORRESPONDING TIMEFRAMES

9.1 PRE-CONSTRUCTION

[84] Site preparation and clearing will be done prior to the construction phase. Initial development of the area includes the enhancement of road networks for increased accessibility and easier transport of materials and supplies. This phase of the proposed project will also involve the acquisition of the necessary documents before actual construction, such as ECC (Amendment), Building Permits, and PTO Application. The Proponent has already initiated community consultation, permitting, exploration and reserve calculation.

9.2 CONSTRUCTION

[85] Immediately thereafter, the development of the area shall follow. This involves construction/installation of the cement plant facilities and other support facilities. The equipment to be used would be purchased and assembled on site. Proper occupational safety and health procedures would be implemented to ensure the welfare of the workers.

9.3 OPERATION OF THE CEMENT PLANT

[86] The normal plant operation is 24 hours a day, seven (7) days a week for 300 days a year. The operation involves the following major activities: cement production and quarrying of raw materials.

9.4 ABANDONMENT

[87] The proposed project is not expected to be abandoned within the next 10 to 13 years of its planned operations, based on the existing MPSA. However, according to past and present geological surveys, the site and its contingent areas have limestone reserves that could last to 100 years based on normal production capacities. However, abandonment of the Plant may be necessary, due to the following potential scenarios:

- Depletion of limestone reserves in the approved MPSA (most unlikely);
- Unsustainable business operations due to economic downturns;
- Changes in zoning and other related ordinances of the Municipality of Calatagan, Batangas;
- Transfer of operations to other sites;
- Accidents and emergencies, either natural or man-made, that resulted to severe facility damage and loss of human life; and
- Closure order from government agencies.

[88] As such, if the abovementioned scenarios happen and result to the partial or total closure of the proposed Project, an Abandonment Plan (which will be submitted to the Mines and Geosciences Bureau as a Final Mine Rehabilitation/Decommissioning Plan) will be initiated by the Advantage Concrete Industries Corp.

9.5 INDICATIVE TIMELINE

89 Advantage targets to accomplish the pre-construction activities by December 2022. Construction of Line 1 will start by January 2023 and is estimated to be finished by December 2023. Commercial operation of Line 1 is targeted to be in March 2024.

90 **Table 9-1** shows the detailed implementation schedule for the proposed project.

Table 9-1: Project Implementation Schedule

Cement Plant	Construction Completion	Commercial Production
Line 1	December 2023	March 2024
Line 2	December 2024	March 2025
Line 3	December 2025	March 2026
Line 4	December 2026	March 2027
Line 5	December 2027	March 2028
Line 6	December 2028	March 2029

10.0 PROJECT COST

[91] Indicative cost for the proposed project is estimated to be **Php 12,000,000,000.00 (12 Billion Pesos)**. These will include the following:

- Detailed engineering studies and designs, including the feasibility study (FS) and acquisition of necessary government permits and licenses;
- Site preparation;
- Construction of project components and facilities;
- Procurement of necessary equipment and materials;
- Environmental management and protection, air pollution devices, and water treatment facilities; and
- Environmental monitoring activities.

11.0 PRELIMINARY IDENTIFICATION OF ENVIRONMENTAL IMPACTS

[92] An Environmental Management Plan (EMP) will be prepared as part of the EIA report. The EMP aims to address potential environmental impacts by proposing mitigation and/or enhancement measures that can be applied during the various phases of project development. At this point of the study, the initial environmental impacts and corresponding mitigation/enhancement measures are listed.

	Environmental Aspect	Environmental Component Likely to be Affected	Potential Impact/s	Prevention/Mitigation/Enhancement Measures
	LAND			
CONSTRUCTION PHASE	Cut and fill activities	Geology/ Geomorphology	Change in surface landform/terrain/slope	▪ Formulation and implementation of proper grading plan
			Change in sub-surface underground geomorphology	▪ Onsite excavations are expected to cause permanent but low level of disturbance ▪ Strict adherence to geotechnical study recommendations
	Site preparation and earthworks	Pedology	Soil erosion	▪ Implementation of appropriate soil erosion control measures
		Terrestrial Ecology	Vegetation removal and loss of habitat	▪ The proposed project is located within an industrial complex.
			Threat to existence and/or loss of important local species	
			Threat to abundance, frequency and distribution of important species	
			Hindrance to wildlife access	
	WATER			
	Water consumption during construction	Hydrology/ Hydrogeology	Depletion water resources/ competition in water use	▪ Implementation of water conservation measures
	Mobilization of construction equipment and materials; Generation of construction wastes	Water Quality	Degradation of groundwater quality	▪ Formulation and strict implementation of waste management plan ▪ Water quality monitoring
	AIR			
	Mobilization of construction equipment and materials	Air Quality and Noise Levels	Degradation of air quality	▪ Formulation and implementation of construction impact management plan ▪ Ambient air quality and noise level monitoring
	PEOPLE			
	Hiring of workers	Local Employment	Increase in local employment	▪ Prioritized hiring of qualified local residents; GAD sensitivity

	Environmental Aspect	Environmental Component Likely to be Affected	Potential Impact/s	Prevention/Mitigation/Enhancement Measures
	Increase in taxes and revenues	Local Economy	Improvement in local infrastructure and social services	▪ Diligent imbursement of taxes and revenues
	Accidents	Public Safety	Possible occurrence of construction-related hazards	▪ Provision of environmental health and safety training prior to construction
OPERATIONAL PHASE	LAND			
	Accidental oil spill	Soil Quality	Soil contamination	▪ Formulation and strict implementation of emergency management plan ▪ Soil quality monitoring
	Quarry operation	Soil Quality	Accumulation of solid waste	▪ Implementation of the solid waste management program by the contractor ▪ Regular hauling of solid waste
	Quarry operation	Flora and fauna	Vegetation removal and loss of habitat	▪ Prepare and implement rehabilitation plans as part of EPEP and FMRDP
	Cement plant operation	Soil Quality	Accumulation of hazardous waste	▪ Develop and implement a hazardous waste management plan that complies with RA 6969.
	WATER			
	Generation of domestic wastewater/ oily wastewater	Water Quality	Degradation of groundwater quality	▪ Provision of siltation ponds ▪ Formulation and strict implementation of waste management plan ▪ Water quality monitoring
	AIR			
	Cement plant operation	Air Quality	Degradation of air quality	▪ Ambient air quality monitoring and CEMS ▪ Use of bag filters
	PEOPLE			
	Hiring of workers	Waste Management	Generation of sewage/solid waste	▪ Formulation and strict implementation of waste management plan
		Population	Change in population size and distribution	▪ Prioritized hiring of qualified local residents ▪ Coordination with the local public employment service

	Environmental Aspect	Environmental Component Likely to be Affected	Potential Impact/s	Prevention/Mitigation/Enhancement Measures
				office
		Social Services	Overburdening of public social services	▪ Prioritized hiring of qualified local residents
		Health	Introduction of disease between migrant and local workers	▪ Medical certificate as part of employment requirements ▪ Formulation and implementation of safety and health program ▪ Provision of health and sanitation facilities within the plant site ▪ Monitoring of occurrence of unusual health problems that may be associated with the project
	Operation of the cement plant and quarry	Local Economy	Increased social and economic financial activities	▪ Implement SDMP
	LAND			
ABANDONMENT PHASE	Decommissioning	Pedology	Soil contamination	▪ Formulation and strict implementation of Abandonment Plan with emphasis on control of sedimentation and prevention of soil contamination
		Terrestrial Ecology	Increase in biodiversity due to rehabilitation activities	▪ Positive impact; No mitigation required
	Disposal of wastes	Groundwater Quality	Possible occurrence of spills and contamination	▪ Formulation and implementation of waste management plan
	AIR			
	Demolition and abandonment activities	Air Quality and Noise Levels	Generation of dust and noise	▪ Watering during dismantling activities to minimize dust generation ▪ Proper vehicle maintenance ▪ Limiting noise-generating activities during daytime ▪ Ambient air quality and noise level monitoring
	PEOPLE			

	Environmental Aspect	Environmental Component Likely to be Affected	Potential Impact/s	Prevention/Mitigation/Enhancement Measures
	Decommissioning activities	Local Community	Possible local disturbance or damage through increased road traffic, noise, etc.	▪ Formulation and implementation of decommissioning impact management plan
	Hiring of workers for demolition and abandonment activities	Local Employment	Increase in local employment during abandonment; Development of new skills	▪ Prioritized hiring of qualified local residents
	Loss of jobs/employment	Local Economy	Reduction in service opportunities for local contractors with established contracts with the project (e.g., maintenance service providers, site transport services, etc.)	▪ Formulation and implementation of Abandonment Plan ▪ Effective human resources management through consultative planning and communication
		Demography	Out-migration of affected project staff to seek job opportunities elsewhere	
NOTHING FOLLOWS				