EXECUTIVE SUMMARY

BACKGROUND

ISLAND QUARRY AND AGGREGATES CORPORATION ("IQAC") is the holder of Placer Patent Nos. 9, 11, 12 and 14 which are currently evidenced by transfer certificates of title (the "Mining Patents"). The said Mining Patents were granted under the Philippine Bill of 1902 sometime during the period 1912 to 1914. These Mining Patents are valid and subsisting over the project area.

IQAC acquired these Mining Patents from its predecessor-in-interest/grandparent company, Rizal Cement Company, Inc. ("Rizal Cement"). Copy of its Securities and Exchange Registration is attached in Annex A. As part of a corporate restructuring exercise in 2001, Rizal Cement transferred all its rights, title and ownership over all its real properties including the Mining to IQAC.

The Mining Patents are currently covered by land titles issued by the Register of Deeds, to wit:

PLACER PATENT NO.	DATE GRANTED	AREA COVERED (in hectares)	CURRENT TCT NO.	DATE OF ISSUANCE OF CURRENT TCT
Placer Patent No. 9	July 20, 1912	37.3275	M-109592	December 18, 2001
Placer Patent No. 11	February 12, 1913	39.2925	M-112715	October 16, 2002
Placer Patent No. 12	May 26, 1914	7.5601	M-109594	December 18, 2001
Placer Patent No. 14	April 17, 1913	17.1505	M-112709	October 16, 2002

The certificates of title originally issued during the period 1912 to 1914 covering the Mining Patents have been cancelled and replaced by transfer certificates of title which have been issued over the years. The copies of the latest transfer certificates of title covering these Mining Patents and indicating reference to the patents are hereto attached in Annex B. Also attached as Annex C is a copy of Mines and Geosciences Bureau Certification dated 6 May 2016.

In most facets of the mining activities, there is always the potential for environmental and ecological problems from the construction of mining facilities, the extraction of ore, to the processing of minerals. In order to assess the likely impacts on the environment and to have a tool of environment management, Island Quarry and Aggregates Corporation (IQAC), submitted an Environmental Performance Report and Management Plan (EPRMP) for the Calabar Quarry Operations Project.

This EPRMP was made in compliance with the provision of Presidential Decree No. 1586, otherwise known as the Philippine Environmental Impact Statement (PEIS) System. The information used in this EPRMP was based on data, plans and documents provided by the management of IQAC. Secondary data sources include previous studies and reports from the IQAC, Department of Environment and Natural Resources (DENR), Environmental Management Bureau (EMB), Mines and Geosciences Bureau (MGB), National Statistics Office (NSO), Philippine Statistics Authority (PSA), the Socio Economic Profile of Binangonan, Rizal and other pertinent Government Agencies and researches conducted within the vicinity.

The assessment focused on the description of the project, its location and evaluation of project's expected impacts on the environment including its impact to the adjoining community. This report also provides mitigating measures to abate any adverse environmental impact resulting during the construction, operation and abandonment phase of the project

An ECC for the Aggregates Crushing Plant was issued by EMB Regional Office 4A on January 24, 2018. Copy of the ECC is attached in Annex O.

I. PROJECT FACT SHEET

Project Title	:	**Calabar Quarry Operations Project**
Project Location	:	Brgys. Palangoy and Pantok, Binangonan, Rizal The Project is to be situated within the 101.33 hectares existing quarry area covered by Mining Placer Patent Nos. 9, 11, 12 and 14 which are duly annotated on Transfer Certificates of Title (TCT) Nos. M109592, M-112715, M-109594 and M-112709, respectively.
Project Cost	:	PhP 270,000,000.00
Background and Nature of Project	:	The Calabar Quarry Operations Project involves an increase in production capacity of its existing mining operation. Calabar Quarry is the source of pozzolan and limestone of IQAC. The previous activities in Calabar Quarry commenced before the effectivity of the EIS System and thus exempted from securing ECC. Its Aggregates Crushing Operation however, is covered by ECC Ref. No. ECC-OL-R4A-2018-0057 issued on Jan. 24, 2018. This project will involve increased extraction capacity of pozzolana and limestone, as well as increased capacity of crushing operations including its support facilities and auxiliaries, thus this amendment.
Size and Scale	:	Extraction started as early as 1912 with the issuance of Patent No. 9 in the name of applicant's predecessors-in-interest. Patent Nos. 11, 12 and 14 were subsequently issued in 1913 and 1914 and mining operation in the area were then immediately conducted by applicant's predecessor-in-interest. This project involves increased extraction of pozzolan from 380,000 MTPY to 1.50MMTPY, as well as extraction of limestone from 500,000 MTPY to 10.89MMTPY for use as cement raw materials, construction materials and materials for various industries (such as but not limited to glass, hygienic products and power). The Project area is 101.33 hectares. The project also includes development of access road, increase in capacity of the installed Aggregates Crushing Facilities from 1.5MMTPY to 2.5MMTPY capacity which include auxiliary and support equipment and other associated facilities and equipment as follows: • Water pumps and pipelines • Power supply connection and power generator • Crushing facility system consisting of crushers, conveyors, screen and other associated facilities • Dust Management System • Concrete block making equipment • Mortar production equipment • Road construction equipment • Sand bagging equipment • Weighing scales and Scale Equipment and Office • Motor pool • Equipment Maintenance Facility • Stockpile • Stockpile Area • Storage Area

- Laboratory or Material Testing Facility
- Administrative Office
- Safety offices and facilities
- Parking Area
- Bunkhouses
- Development of access road.

Objective : To increase the extraction capacity of limestone and pozzolan and aggregates crushing

Geographical Coordinates : Provided below are the coordinates of the Project area:

TECHNICAL DESCRIPTION PATENT 9		
LINE	**BEARING**	**DISTANCE**
LOT 16232 TCT# M- 109592		
1 – 2	N.00° 53'E.	795.48 M.
2 – 3	S.89° 57'E.	455.86 M.
3 – 4	S.10° 19'W.	1,092.20 M.
4 – 5	N.61° 42'W.	171.28 M.
5 – 6	N.61° 51'W.	139.70 M.
6 – 1	N.00° 38'E.	132.58 M.
TIE LINE: S.55° 19'E.,515.00 M.; From RLM# 2, RIZAL		

TECHNICAL DESCRIPTION PATENT 11		
LINE	**BEARING**	**DISTANCE**
LOT 16278 TCT# M- 112715		
1 – 2	N.73° 09'W.	98.57 M.
2 – 3	N.00° 38'E.	781.36 M.
3 – 4	N84° 05'E.	101.46 M.
4 – 5	N.06° 43'E.	150.86 M.
5 – 6	N.05° 45'.E	158.00 M.
6 – 7	N.04° 02'E.	185.43 M.
7 – 8	N.06° 26'W.	449.32 M.
8 – 9	S.41° 17'E.	599.63 M.
9 - 10	S.39° 28'E.	241.74 M.
10 - 11	S.15° 45'W.	169.90 M.
11 - 12	S.15° 51'W.	169.70 M.
12 - 13	S.89° 57'W.	455.86 M.
13 - 1	S.00° 53'W.	795.48 M.
TIE LINE: S.55° 19'W.,515.00 M.; From RLM# 2, RIZAL		

TECHNICAL DESCRIPTION PATENT 12		
LINE	**BEARING**	**DISTANCE**
LOT 13814 TCT# M- 109594		
1 – 2	S.17°49'W.	327.18 M.
2 – 3	S.04°13'W.	304.20 M.
3 – 4	S.81° 40'W.	62.97 M.
4 – 5	N.05° 31'W.	379.07 M.
5 – 6	N.17° 25'E.	327.60 M.
6 – 1	S.61° 51'E.	139.70 M.
TIE LINE: S.47° 58'E.,734.02 M.; From RLM# 2, RIZAL		

TECHNICAL DESCRIPTION PATENT 14

	LINE	**BEARING**	**DISTANCE**
	LOT 16274 TCT# M- 112709		
	1 – 2	S.00° 38'W.	132.58 M.
	2 – 3	S.17° 25'W.	327.60 M.
	3 – 4	N.78° 21'W.	188.13 M
	4 – 5	N.20° 51'W.	596.64 M.
	5 – 6	S.73° 08'E.	419.83 M.
	6 – 1	S.73° 09'E.	98.57 M.
	TIE LINE: S.55° 19'E.,515.00 M.; From RLM# 2, RIZAL		
Manpower		Manpower complement will be composed of men and women who are fit to work and of no particular working age. During quarry development, an estimated manpower of 30 workers will be hired for the Project, 10 are directly hired by IQAC and 20 to be employed by the Contractor. During Construction, Erection and Installation Stage, an estimated manpower of 52 workers for the project will be required, 3 are directly hired by IQAC and 49 to be employed by the Contractor. During Aggregates operations, an estimated manpower of 28 workers for the project will be required, 5 are directly hired by IQAC and 23 to be employed by the Contractor. During Quarry Operations, 70 workers will be required, 9 are directly hired by IQAC and 61 to be employed by the Contractor. During decommissioning, work will be outsourced to contractors supervised by the MEPEO of IQAC. The Company complies with the equal opportunity principle in hiring persons with disability (PWD) as well as women. This means that the Company gives employment opportunities to PWDs and women provided the person is qualified to the position. A qualified employee, whether a woman or with disability is subject to the same terms and conditions of employment and the same compensation, privileges, benefits, incentives and allowances as any qualified employee of the Company. For plantilla-based/regular employees, monthly salaries or wages for services rendered by an employee are timely paid twice a month via bank transfer. For transparency, the said payments are duly acknowledged by the employees through electronic and/or manual pay slips. Thirteenth month pay is likewise paid to all qualified employees in compliance with the relevant laws, rules and regulations. Qualified employees also enjoy various benefits such as vacation leaves, sick leaves, overtime pay, health insurance, health plan, separation pay, retirement plan and allowances, as well as safety provisions like Personal Protective Equipment (PPE) and personal emergency kits, contributions and remittances for SSS, Philhealth and Pag-IBIG fund and other welfare benefits. Employees who have queries on the salaries or benefits they receive or are entitled to may bring their concerns with the Human Resources Department. For contractors or manpower agencies who engage contractuals, the Company undertakes an accreditation process wherein contractors are required to submit documents to establish that they are duly registered with

		the Securities and Exchange Commission or Department of Trade and Industry and with the Bureau of Internal Revenue and that they have substantial capital and/or investments to ensure that they can perform the work to be done and are compliant with relevant laws and regulations, specifically on the prohibition against labor-only contracting. Without this accreditation, the Company will not engage the services of the contractor and ensure compliance by the contractors with all the rights and benefits under labor laws, rules and regulations. The Company strictly enforces such contractual provisions in order to ensure that the contractor's employees are paid all statutory benefits and that the contractor comply with all the requirements as provided by law. For all of these manpower requirements, applicants from the host community are given priority subject to the qualifications of the applicant to the position. Job vacancies/openings are posted in the barangay and municipal bulletin boards for qualified locals to have an opportunity to work for IQAC. Local officials sometimes provide recommendations for qualified workers.
Duration of Project	:	After securing all the required and necessary clearances and permits, increased extraction and aggregates crushing activities will immediately follow and quarry operations will last approximately for 32 years for limestone and 17 years for pozzolan.

Project Components	:	The components of the Project are:
		• Extraction of pozzolana, limestone and limestone aggregates with increased capacity
		• Operations of Crushing Plant with increased capacity with its ancillary facilities as follows:
		  • Crushers
		  • Conveyors
		  • Screen
		  • Water pumps and pipelines
		  • Power supply connection and power generator
		  • Dust Management System
		  • Concrete block making equipment
		  • Mortar production equipment
		  • Road construction equipment
		  • Sand bagging equipment
		  • Weighing scales and Scale Equipment and Office
		  • Motor pool
		  • Equipment Maintenance Facility
		  • Stockpile
		  • Stockpile Area
		  • Storage Area
		  • Laboratory or Material Testing Facility
		  • Administrative Office
		  • Safety offices and facilities
		  • Parking Area
		  • Bunkhouses
		• Development of access road.

PROPONENT PROFILE

Project Proponent	:	**Island Quarry and Aggregates Corporation (IQAC)**
Address	:	Brgys. Pantok and Palangoy, Binangonan, Rizal
Contact No.	:	(632) 697-7000 loc. 3801
Contact Person	:	**ENGR. NINO BERT V. ADVINCULA** IQAC Tenements Manager Email: ninobert.advincula@cemex.com

EIA CONSULTANTS' PROFILE

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Team Members		**Company**
Engr. Ria Caramoan	:	Mediatrix Business Consultancy
Engr. Reynaldo Tejada	:	
Mr. Alexis Fernando	:	
Mr. Juvinal Esteban	:	
Mr. Hernani Bayani	:	
Mr. Abraham R. Lucero	:	Freelancer
Ms. Myra Talosig	:	Simmons Consult
Mr. Rodolfo Romarante	:	
Aileen Redondo	:	
Ryan Dela Cruz	:	
Michelle Ebasan	:	

II. PROCESS DOCUMENTATION

EIA Team

The preparation of this **Environmental Performance Report and Management Plan (EPRMP)** was prepared by different individual experts. Provided in Table 1 is the list of the EIA Preparers assisted by the company's authorized personnel, who provided the necessary technical data, information and description of the project operation which is essential to the project study.

Table 1: EIA Team

NAME	DESIGNATION	IPCO / LICENSE NO.	EXPERTISE	PARTICIPATION
Ms. Matilde Fernando	Project Manager / EIA Team Leader	IPCO-035	Socio-Economics and Public Participation	Preparation/consolidation of Study/ Report and consolidation of documents for the whole project study relevant to the requirements needed for the application
Engr. Ria Caramoan	Assistant Team Leader	IPCO-106	Air and water	Preparation of Project Description and water module
Engr. Reynaldo Tejada	Air and Noise expert	IPCO-036	Air and noise quality, air and noise modeling	Preparation of the air and noise module
Mr. Alexis Fernando	Researcher	IPCO-034	Research and community engagement	Gathering of secondary information
Mr. Juvinal Esteban	Social Worker	IPCO-091	Social work and community engagement	Preparation of socio module
Mr. Abraham R. Lucero	Geologist	NA	Geology	Preparation of Geology Module
Ms. Myra Talosig	Modular Preparer	IPCO-190	ERA, EIA, EM	Preparation of Terrestrial flora and fauna Freshwater ecology
Mr. Rodolfo Romarante	Modular Preparer	IPR4B-016	ERA, EIA	
Aileen Redondo	Modular Preparer	NA		
Ryan Dela Cruz	Modular Preparer	NA		
Michelle Ebasan	Modular Preparer	NA		

EIA Study Schedule

Table 2 below summarizes the EIA study schedule for the project. Activities already conducted are the Information, Education and Communication (IEC) activities, Public Scoping, Technical Scoping, conduct of additional baseline studies and preparation of the Environmental Performance Report and Management Plan (EPRMP). Upcoming activities include EIARC reviews, conduct of public hearing and site visit before issuance of the Environmental Compliance Certificate.

Table 2: EIA Schedule Study Activities

Activity	Date
Site assessment and validation and IEC	6/2015
Public Scoping	11/2015
Submission of PSR and PDS with request for Technical Scoping	1/16
Technical Scoping	7/17
Data gathering	6/15-10/17
Report preparation	3/16-10/17
Procedural screening by EMB Casehandler	3/18
1st review by EIARC	5/18/18
2nd EIARC Review	7/9/18
Public Hearing	
Final Review by EIARC	
Complete staff work	
ECC issuance	

EIA Study Area

The study areas in general are the primary and secondary impact areas. The primary impact areas of the project are the project area itself an, i.e. Brgys. Palangoy and Pantok and the sensitive receptor areas such as St. Monique and Ynares Subdivisions in Binangonan, Rizal which way may be affected or enhanced by the impacts of the project particularly in its quarry and aggregates operation.

The secondary impact areas comprise the haul roads where the trucks will pass through to transport the materials. These secondary impact areas are the Manila East Road and East Ridge Avenue in Binangonan. The possible social and economic impacts of the project during its construction and operational phase are being considered. These areas have been delineated as the primary and secondary area as per environmental sector (air, water, terrestrial, people) and per sensitive receptors in the impact area map.

EIA Methodology

The EIA was prepared in accordance with the Philippine Environmental Impact Statement System. Provided below is the EIA methodology for each environment sector/component.

Table ES3: EIA Methodology

EIA Study Module	Parameters/Scope	Baseline Sampling and Methodology
Land		
Geology /Geomorphology, Pedology, Land Use & Classification	Reconnaissance, land use, land classification assessment, slope, soil types and classification, erosion	Secondary data, soil sampling and testing, review of geological reports and maps, soil site assessment
Terrestrial Biology – Wildlife and Vegetation	Flora and fauna species inventory, species endemicity and conservation status, species abundance, frequency and distribution	Use of secondary data and inventory

EIA Study Module	Parameters/Scope	Baseline Sampling and Methodology
Water		
Hydrology/ Hydrogeology	Regional hydrogeology, catchment and drainage system	Spring & well inventory, flow measurements, use of secondary data, water balance analysis, flow duration and water flow analysis and groundwater recharge and production analysis, interviews
Water Quality	Physico-chemical and bacteriological characteristics of rivers, wells, springs, and coastal water	Primary data were secured through water sampling and laboratory analysis with additional sampling station within Primary Homes' subdivision.
Freshwater Ecology	Full accounting of all existing benthic habitats, species, composition, density, and diversity of sea grass resources and associated macro benthic algae in front of the project site , commercially-important macro invertebrates in the inter-tidal areas, plankton community	Use of primary and secondary data and interviews
Air		
Air Quality	Ambient air quality and noise levels	Primary data through sampling and laboratory analysis with additional sampling station noise within Primary Homes' subdivision
Meteorology/ Climatology	Monthly average rainfall, climatological normal and extremes, wind rose diagrams, and frequency of tropical cyclones	Use and review of secondary data
Noise	Characterization of ambient noise level	DENR standard methods and procedures for sampling and measurement
Climate Change		
Temperature change	Seasonal Temperature increase (in °C) in 2020 and 2050 under medium range emission scenario in Tanay Monthly Average Temperature without Climate Change Monthly Average Temperature with Climate Change (2006-2035)	*Effects of Temperature Increase*
Rainfall change	Seasonal rainfall change (in %) in 2020 and 2050 under medium range emission scenario in Tanay Monthly Average Rainfall without Climate Change (1980-2010) Monthly Average Rainfall with Climate Change (2006-2035) Monthly Average Rainfall with Climate Change (2006-2065)	Effects of change in rainfall pattern

EIA Study Module	Parameters/Scope	Baseline Sampling and Methodology
Greenhouse as Assessment	GHG Emissions based on IPCC 2006 Guidelines and USEPA Procedure	Bunker oil consumption vs GHG emissions
People: Socio-Economic, Health		
Public health and Demography	Morbidity and mortality trends, Demographic data of impact area: - Number of households and household size - Land area, - Population, - Population density /growth - gender and age profile, - literacy rate, profile of educational attainment	Interviews with key elected officials of the barangays (from barangay captains to councilors and the social welfare barangay officers/ barangay health workers); analysis of secondary health data; Use of secondary data from RHU and NSO; Interviews with the locals; household-level survey
Socio-economics	Socioeconomic data: Main sources of Income, Employment rate/ profile, sources of livelihood, Poverty incidence, commercial establishments and activities, banking and financial institutions	Perception surveys, Interviews with municipal and barangay officials; analysis of secondary data; analysis of survey results Provision of traffic management flow in a traffic management plan Provision of housing options for workers within the vicinity
Environmental Risk Assessment		
Risk Assessment	Safety risks and physical risks	Consequence and Frequency analyses to be undertaken using the methodology described in the Revised Procedural Manual for DAO 2003-30

Public Participation

1. Scoping

Public participation through Public Scoping was conducted as early as 04 November 2015. Full Scoping Report is provided in Annex I. Among the issues and concerns raised during the activity include the following:

- Effects and mitigating measures for blasting to neighboring communities
- Type of minerals that will be mined
- Hauling road to be used and no. of trucks per day
- Lagoon rehabilitation
- Invitation to affected communities to participate in public consultations
- Coverage of EIA Study
- Difference of the previous operations from the proposed expanded operation
- Provision of Mitigation measures
- Climate Change Adaptation and Disaster Risk Reduction and Disclosure of its Plans to the local DRRMO
- Buffer zone between the quarry area and the community especially St. Monique subdivision
- Consideration of adapting the Programs of the Governor in the project's implementation
- Provide Water Teatment

The Proponent responded positively in all of these concerns raised. Full Public Scoping Report is attached in Annex I.

2. Perception Survey

Perception survey was also conducted in September 2017. The Host barangays, Pantok and Palangoy were surveyed including the specific residential areas/subdivisions within these barangays such as St. Monique and Eastridge and nearby/neighboring barangays such as Mahabang Parang and Darangan in Binangonan, Rizal. Results of the survey show that most residents are concerned on the environmental effects of the project especially generation of dust and impact of blasting.

III. EIA SUMMARY

Summary of alternatives considered in terms of siting, technology selection/operation processes and design

There is no other project alternative considered for this project because the primary consideration is the Mining Patents that IQAC have which Patents were dated back as early as 1913.

In terms of routes for the transport of materials, the route used is the existing Eastern Rizal road network from Antipolo City using the Kaytikling road thru the Ortigas Extension after Junction Cainta, Rizal passing thru Mahabang Parang of Angono where the entrance of the quarry site is located. This route is used because most of the materials are transported to Solid Cement Corporation (SCC).

For the mode of extraction or mining, mitigation or enhancement measures, there are no other Alternatives and Criteria for the Mining Method and Technology used by IQAC for this Project because it has proven through its other claims in other project areas that the mining methodology including the controlled blasting technology being implemented by its contractors are effective, environment and people-friendly. Surface mining with multiple benching will be implemented for the project and no underground works will be undertaken.

IQAC used the following mining parameters as basis in its preparation of the extraction plans for the entire life of the project:

Mining Parameters	
Bench height	10 meters
Final bench width	5 meters
Working bench width	> 10 meters
Ramp width	>10 meters
Road gradient	1:10
Bench slope	80 degrees
Pit slope	68 degrees

Concise integrated summary of the main impacts and residual effects after applying mitigation

The main impact for this project arechange in elevation, removal of topsoil and vegetation, siltation, erosion, generation of dust and noise by the quarry activities particularly the conduct of blasting which also causes vibration. These are being mitigated by IQAC by employing the proper controlled blasting protocol. More importantly, among the main impacts of the project is the positive impact of community benefits that will be generated under the SDMP, progressive rehabilitation under the EPEP and final mine rehabilitation for FMR/DP.

Provided in Table 3 is a summary of the findings from the baseline surveys conducted. The presentation follows the EPRMP sections that describe the existing environment in the project site. Data are presented per module that corresponds to the land, water, air and people environments.

Table 3: Summary of Baseline Characterization

MODULE	BASELINE CHARACTERISTICS
LAND	
Land	The Project area which is located in Barangays Palangoy and Pantok in Binangonan, Rizal is classified as mineral land by the municipality of Binangonan. Since it has started operations from the time it acquired jurisdiction and authority over the area up

MODULE	BASELINE CHARACTERISTICS
	to now, IQAC implements environmental management and mitigating measures to ensure safety of the project and its project environs such as implementation of safe controlled blasting through its licensed and experienced contractors. Todate, there are no mined out areas yet declared by IQAC because the previous operations remain constant in terms of production/extraction capacity. The Official land classification status of the mining project area is Alienable and Disposable land, covered with Transfer Certificates of Title (Private Land, TCTs are provided in the Annexes). Based on the Land Use Map of the Municipality of Binangonan, the area is within Industrial Zone (Figure 2.1). The land cover is a combination of wooded grassland, annual crop, open/barren and built up area based from NAMRIA.
Topography	About 65% of Binangonan are hilly terrain while the rest are generally plain. The highest peak is Mt. Susong Dalaga 750 meters above the sea level. There are seven barangays with slopes ranging from 0-3 degrees; eight barangays with 3-8; fifteen barangays with 8-18; and nine barangays with 18-30.
Pedology	Soil classification is based on the data gathered from the soil survey division of the bureau of soil and water management, these are: • BOULEVARD CLAY • BARAS CLAY • BINANGONAN CLAY • TERESA CLAY • ANTIPOLO CLAY • TUTULO CLAY • CALANTAS CLAY Soil sampling was conducted at the project site in September 2017. The results on current soil baseline information will not be affected with the project implementation of the expanded capacity because the land use is the same and the quarry methodology will not use chemicals which may contaminate the soil. Also, since the Project is extraction of limestone and operations of the aggregates facility, the project will maintain the same soil quality.
Terrestrial Ecology	
Flora	Local forest is generally classified as Savana. Its vegetation is characterized by the growth of talahib cogon, native ipil-ipil, madre cacao and bamboos. Fruit bearing trees like mango, atis, duhat, bignay are grown in both upland and lowland. Trees of dipterocarp species, the source of lumber, are seldom found the municipality. However, there are species like narra and mahogany cultivated in the lowland. Flora surveys were conducted on September 15 to 19, 2017 using the Belt - transect method (Plate 2). In each station transect lines, 250 meters in length and 4 meters in width were laid across the sampling stations. All tree species intercepted along the belt- transect with diameters greater than 5m were identified and counted. Presence of shrubs and grasses were also identified. A total of 37 species were observed within the study area. The species can be resolved into 17 floral families. Below are representative species of flora that were observed within the sampling stations. Representative species were collected from the four patents.
Fauna	Terrestrial communities, especially forests are complex. A thorough study of such an area could take years. But to get a good picture of community interrelationships a brief study is enough to generally represent a community. Avifaunal survey was conducted through transect count, mist netting (Plate 3) and

MODULE	BASELINE CHARACTERISTICS
	incidental survey. Transect count, was used to survey birds in large open areas. All birds seen or heard on either sides of each transect were identified and counted within a fixed distance from the observer. Mist nets were also used; nets were laid along possible travel lanes for birds. Birds were identified according to their local names, acoustic calls and visual representations with the aid of a field guide (Tañedo, 2015). Birds were released right after photo documentations. Sampling for Volant mammals was conducted using mist nets (see photograph above). The nets were placed along travel lanes of bats at dawn and checked every 8 hours. In each station at least two mist nets measuring 4 m x 12 m with 36 mm mesh size were installed near fruiting trees, in ridge tops or probable flyways. Bats were identified using the Key to Philippine Bats (Ingle and Heaneys, 1992). Captured bats were removed individually and were placed in temporary holding devices such as cloth bags. After documentation, bats were revitalized with sugar solution and released back into the wild. Frogs were sampled using cruising methods or opportunistic sampling. Streams and creeks were search for frogs. All captured individuals were subjected to morphometric measurement. Frogs and other herpetofaunal species were identified based on Amphibians and Reptiles of Luzon Island (Philippines), VII: Herpetofauna of Ilocos Norte Province, Northern Cordillera Mountain Ranged (Brown et. al 2012). Amphibians and Reptiles of Luzon Island, V: The Herpetofauna of Angat Dam Watershed, Bulacan Province, Luzon Island, Philippines (Mcleod et. al 2012).
Geology	Based on the published Bureau of Mines geologic map of the Manila & Quezon City quadrangle, the study area in Barangays Palangoy and Pantok, Binangonan, Rizal is underlain by two (2) rock formations. These are the younger Pleistocene age Guadalupe Formation and the older Early Miocene age Angat Formation. The Guadalupe Formation is confined in the entire western sections of the study area. It consist of thin to medium-bedded, fine grained vitric tuffs and welded volcanic breccias with subordinate amount of tuffaceous, fine to medium grained sandstone. This type of rock deposit in the area was once quarried as Pozzolan component of cement raw material of the previous Rizal Cement Corporation. The eastern section of the study area is underlain by the older Early Miocene Angat Formation. It generally consist of well bedded to massive limestone associated with thin siliceous layers and limy sandstone partings, lower clastic facies compose of thinly bedded sequence of calcareous shale, clayey sandstone, sandy limestone and conglomerate. Other authors identified this type of limestone belonging to the upper Limestone Member of the Binangonan Formation with an age of Late Oligocene to Early Miocene. The limestone in the area is generally massive, light cream to pink to bluish gray and fossil-rich. This carbonate unit, which attains a thickness of 900 meters, represents deposits of shallow-water reef complexes (*MGB, 2003*). This type of limestone deposit in the area was also once quarried as high lime component of cement raw material of the previous Rizal Cement Corporation.
The Water	
Water Quality	There are no other water bodies present in the project site or near the area. Thus, sampling and analysis were undertaken from the lagoon and siltation ponds in the quarry area for its upstream, midstream and downstream areas. Sampling was conducted on July 20, 2017. To identify and assess project impact in terms of degradation of groundwater and surface water quality, DENR standard methods and procedures for sampling and analysis was employed. Results showed compliance to DENR standards as per DAO 2016-08.
Freshwater	Freshwater ecology was undertaken on Sept. 15 to 19, 2017 to study the

MODULE	BASELINE CHARACTERISTICS
Ecology	interrelationship of organisms and their environments were undertaken; in this study only the macroinvertebrates, epilithic assemblages and freshwater fish were studied because they are good indicators of the water quality in aquatic ecosystems like lagoons. Moreover, these organisms are sensitive to slight changes in water quality and are greatly affected by environmental stressors such as pollution. There were no researched related studies conducted prior to the conduct of sampling. Freshwater Biota Survey was conducted in the accessible part of the Calabar quarry lagoon. The area of the lagoon which is approximately 3.72 hectares is within the area of Patent 10. The lagoon was once a quarried area that accumulated water from years of rain. Only one sampling station was done because most parts of the lagoon is inaccessible and no means of transportation like boats were not allowed in the lagoon. Macroinvertebrates were sampled on a stream connecting to the lagoon.
The Air	
Air Quality	Ambient air sampling was undertaken on March 25, 2017 in 3 locations, namely: Within Aggregates Operation, Near Pantok/East - Ridge Side and Quarry area. Results show that the ambient air quality is within the DENR Standards except for TSP results where the Aggregates Operation sampling location exceeded the standards which have been influenced by ongoing operation of crusher machine, vehicles and equipment operations.
Noise	Noise monitoring was conducted on the same date and sites as the ambient air on a 1-hour monitoring. Measurement of each station was conducted 4 times every 15 minutes for 1 hour so that a representative reading of noise level propagation will be monitored with respect to the time increment based on a 1-hour monitoring test. Monitoring was conducted on a sunny weather associated with light to moderate winds. The prevailing winds at the time of sampling came mostly from Southwest to Northeast (SW-NE) and West to East (W-E) directions.
Climate	Binangonan has two distinct seasons: dry from November to April and wet during the rest of the year. The heaviest rains usually occur in the months of July, August and September. The coolest period occurs the months of November to February.
Noise	Ambient noise results passed the DENR Standard for Noise Quality. Provided in Chapter 2 is the details of the sampling and test results.
The People	
Population	Binangonan's population is 249,872 as of May 10, 2010 according to the Philippine Statistics Authority. A Household Perception Survey was conducted in September 2017. The Host barangays, Pantok and Palangoy were surveyed including the specific residential areas/subdivisions within these barangays such as St. Monique and Eastridge and nearby/neighboring barangays such as Brgy. Darangan also in Binangonan, Rizal and Mahabang Parang in Angono, Rizal. Results of the survey show that most residents are concerned on the environmental effects of the project especially generation of dust and impact of blasting. Based on the assessment of the peoples' socio-economic condition as part of the survey, more than half of the respondents are employed wherein 30% have their own livelihood with enough income for their family. Almost three-fourths of the respondents were mostly college graduates which enable them to earn enough and provide for their family. There are only 8 households or families that will be affected or relocated resulting from the project implementation. Direct negotiation/discussion with them will be undertaken.

The environmental performance of Calabar Quarry from 2014-2017 provided compliance to DENR standards on air and water. The monitoring conducted was Proponent-driven thru a creation of a Multi-partite Monitoring Team (MMT) in 2014. This monitoring activity was not anchored on an ECC compliance mechanism because the project existed before the effectivity of the EIS System. It will also be noted that for some aspects and parameters, only 2016 and 2017 performances were provided because the Proponent together with the MMT have just established the parameters and stations for semestral monitoring. Please note that monitoring is semestral that is why some columns and rows have no information. Also, instead of Self-Monitoring Reports (SMRs), Compliance Monitoring and Validation Reports (CMVRs) were submitted as per the project's MMT. Proof of submission of CMVR is provided in Annex E.

This Study showed comparison between a no–project and with project scenario has formed a Summary matrix of Environmental Issues and Impacts, to enable the EIA team conclude and analyze environmental degradation and/or improvements.The analysis briefly presents the main environmental issues and possible impacts scenarios. Ratings of Impacts are qualitative only.

Risks and uncertainties relating to the findings and implications for decision making
Among the risks of the project which could be a potential show stopper or could have a material or significant impact on the decision making of the government as well as the project proponent is the uncontrolled and irresponsible blasting activities that may be undertaken by the Proponent's possible Blasting Contractor. To avoid this, a strict contract and monitoring of the Contractors will be undertaken as what is being undertaken in IQAC's other contract areas.