
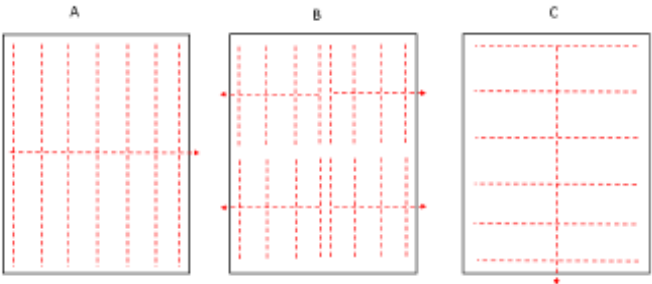


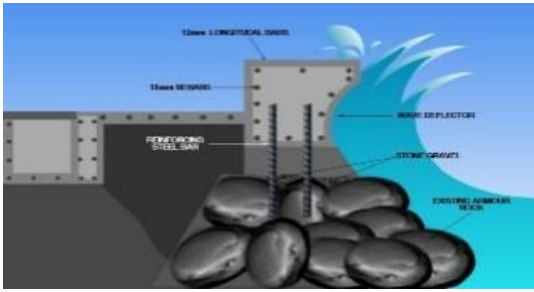

BUOD NG EIS PARA SA PUBLIKO

ES 1.0 Fact Sheet ng Proyekto

Table ES-1. Project Fact Sheet

Pangalan ng Proyekto	PROPOSED DIAMOND RECLAMATION AND DEVELOPMENT PROJECT (100-HECTARE ISLAND)	
Lokasyon ng Proyekto	Katubigan ng Manila Bay sakop ng Teritoryo ng Lungsod ng Bacoor	
Kategorya ng proyekto base sa EMB Memorandum Circular 2014-005	"Category A-1 New": Environmentally Critical Project (ECP) / MC 2014-005 Major Reclamation Project ≥ 50 hectares	
Klasipikasyon ng Proyekto base sa EMB Memorandum Circular 2014-005	3.3 Reclamation and other land restoration project	
Iskop ng Proyekto	Pahalang na Reklamasyon (Paalala: Hiwalay na ECC ang iaaplay para sa vertical na pagdebelop at sa panggagalingan ng materyales panambak)	
Otoridad sa pagsasagawa ng reklamasyon	Memorandum of Undersatnding (MOU) between the Philippine Reclamation Authority (PRA) and City Government of Bacoor dated 07 December 2016	
Lawak ng Proyekto	100 Hectares	
Kabuuang Halaga ng Proyekto	Php 16.62 Billion	
Buod ng mga Pangunahing Bahagi	Major Components	Brief Description
	<ul style="list-style-type: none"> One (1) Island 	100 ha
	<ul style="list-style-type: none"> Internal Road Network 	40 m wide (2 x 2 vehicle lanes 8 m, 2 x 8 m non-motorized vehicle lans,8 m refuges lanes) 
<ul style="list-style-type: none"> Drainage System 	A conceptual Drainage option for 100 ha reclamation 	

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	<ul style="list-style-type: none"> Storm Surge Protection 	<p>Typical Wave Deflector</p> 
	<ul style="list-style-type: none"> Access way 	<p>Integral to Master Plan as per Conceptual plan. The access way of the Diamond Reclamation is designed linking internally to the 230/90-ha islands of the adjacent Bacoor Reclamation and Development Project</p> 
<p>Tagapagtaguyod</p>	<p>BACoor CITY GOVERNMENT</p> <p>The Honorable Mayor Lani Mercado Revilla Office of the Mayor Molino Boulevard, Bacoor, Cavite, Philippines Telephone No.: (046) 481 4100</p>	
<p>EIA Preparer / Consultant</p>	<p>TECHNOTRIX CONSULTANCY SERVICES, INC.</p> <p>Unit 305 FMSG Building, Balete Dr. QC 1101 Telephone No.: (632) 416.4625 (632) 745.5602 Cellular No.: 0917.8255203 E-mail address: technotrixinc@gmail.com</p> <p>Contact Person: Edgardo G. Alabastro, Ph.D.</p>	

Notes:

Ang Syudad ng Bacoor ay nagpapalano ng (2) dalawang proyektong reklamasyon at ito ay ang mga sumusunod:

- **The Proposed Bacoor Reclamation and Development Project (BRDP), and**
- **The Proposed Diamond Reclamation Development Project (DRDP)**

Makikita sa **Figure ES-1** ang lokasyon ng dalawang reklamasyon na proyekto.

Ang mga pribadong sektor na magdedebelop ng (DRDP) at (BRDP) na proyekto ay magkabaibang korporasyon kaya't magkaibang ECC ang kinakailangan ng bawat isa.

Gayunpaman, ang nasabing dalawang proyekto ay mayroong magkaparehas na impacts assessment.

- ✓ The channels separating the islands are small and intended only for better water circulation; Circulation, sedimentation modelling will take holistically both the BRDP and the DRDP
- ✓ The access ways are common and serve all of the islands.
- ✓ Ang tema ng master plan ay magkamukha. Ang master plan ay ginawa at binase sa dalawang proyekto na BRDP at DRDP

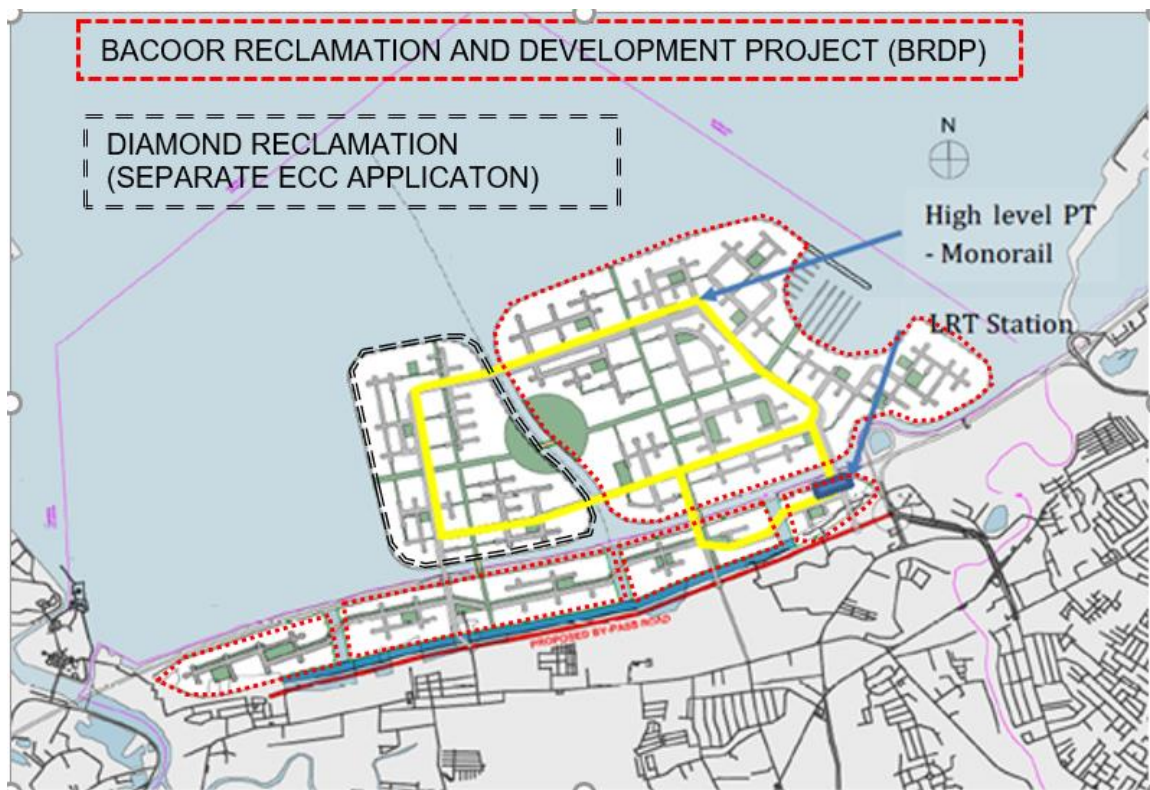


Figure ES-1. Mapa ng Lokasyon ng Diamond at Bacoor Reclamation Projects

ES 1.1 Maikling Background ng Proyekto

Ang Environmental Impact Statement (EIS) Report ang nagsisilbing unang requirement para sa aplikasyon ng Environmental Compliance Certificate (ECC) para sa planong proyekto. **Ang ECC application na inaapply para sa planong reklamasyon ay para lamang sa pahalang na development (horizontal development), kabilang na ang konstruksyon ng mga kalsada.** Ang vertical development o ang tinutukoy na *Operations Phase* ay mag babase sa mga karapatdapat na requirements ng Philippine EIS System (PEISS) at hindi kasama sa nasabing ECC application.

Ang planong reklamasyon ay itatayo sa Katubigan ng Manila Bay sakop ng Teritoryo ng Lungsod ng Bacoor at ang mga impact barangays ng nasabing proyekto ay ang mga sumusunod:

- Sinaguelasan
- Alima
- Campo Santo
- Tabing Dagat
- Digman

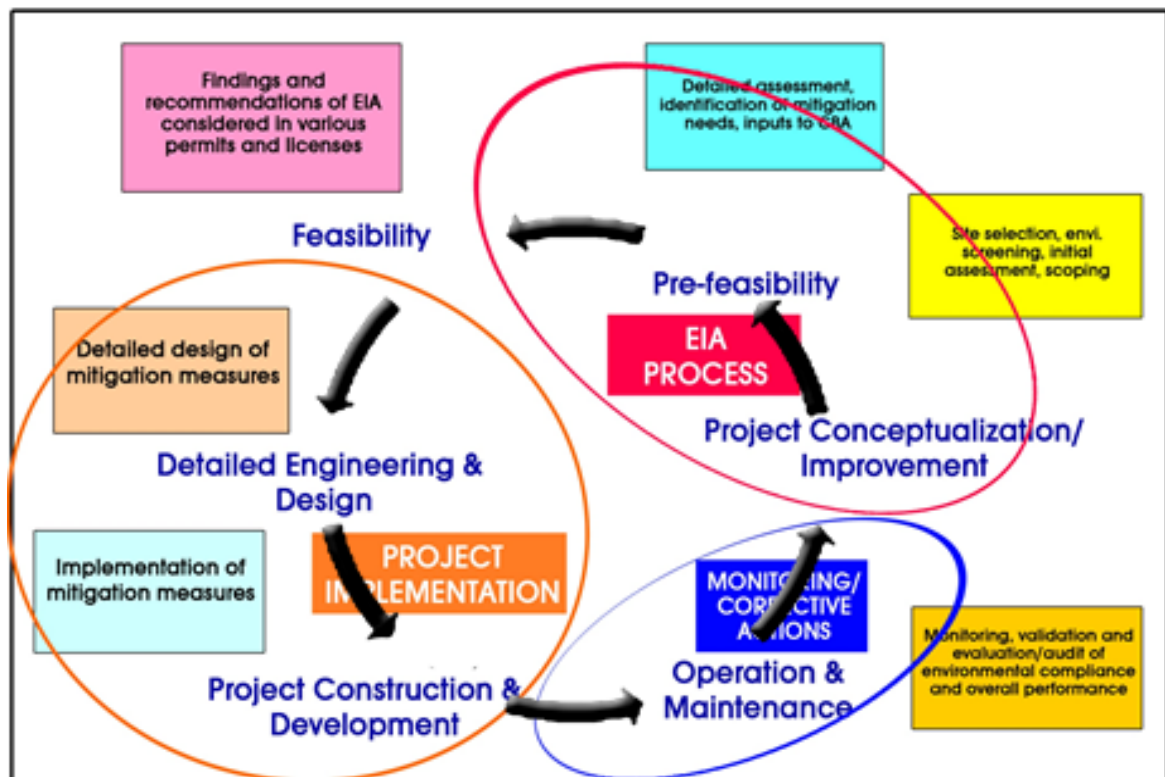
- Kaingin
- Maliksi III
- Maliksi I
- Talaba II
- Talaba I
- Zapote V

Ang proyekto ay may (1) isang isla at may layong humigit kumulang sa 168 meters mula sa Proposed Bacoor Reclamation and Development Project (230 Hectares) at may layong humigit kumulang sa 180 meters naman sa Inner Island (ng 90 Hectares).

ES 2.0 Proseso ng Dokumentasyon sa paghahanda ng EIA

Ang EIA Report para sa Proposed Reclamation Project ay inihanda at nakasunod ayon sa basic principle ng Philippine EIS System (PEISS), i.e. na ang **EIA/ECC ay planning tool at hindi permit**, substantiated hereunder.

- The Revised Procedural Manual (DAO 03-30) stipulates this basic paradigm (of a planning tool), shown in the chart below.



Reference: Revised Procedural Manual for DENR Administrative Order No. 30 Series of 2003 (DAO 03-30)

Figure ES-2. Chart Showing the Planning Tool Concept Based on DAO 03 30

- Ang Pamublikong Anunsiyo sa isang pangunahing pang araw-araw na pahayagan ng Dating DENR Kalihim J.L. Atienza na nagsasabing ang konsepto ng Pagpaplano ng Tool ng Isang ECC na ipinapakita sa ibaba.(Reference is also made to <https://litoatienza.wordpress.com/2009/11/26/due-process-is-a-requirement-of-good-governance-secretary-lito-atienza/>)

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Note: The terms Environmental Impact Assessment (EIA) and Environmental Impact Statement (EIS) are used interchangeably in this report.

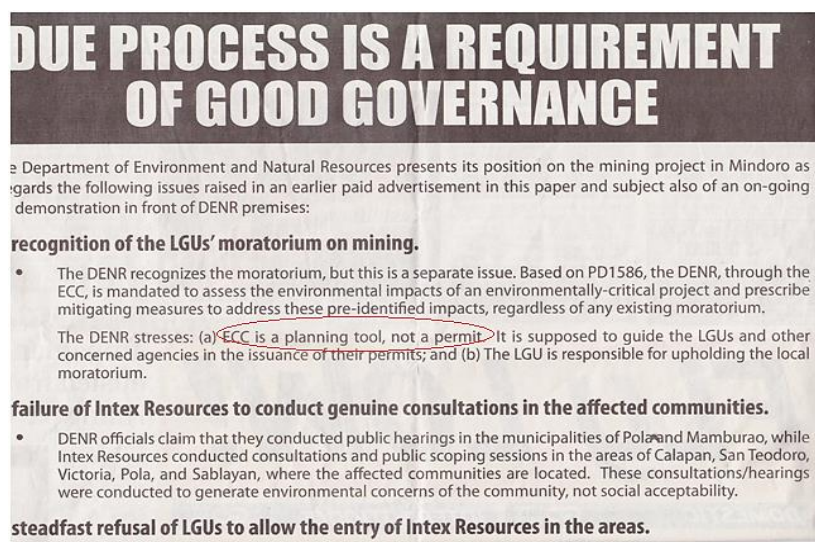


Figure ES-3. Verbatim excerpts from an ECC granted by EMB Region IV-A.

c. Moreover, the details of a project are established post-ECC, as stipulated in **page 10 of the Revised Procedural Manual**, quoted verbatim below:

iii) *During the project's **Detailed Engineering Design (DED)** stage, which is post-ECC, the generic measures identified during the EIA study at the FS stage will now be detailed based on the project facility design and operational specifications. Additional baseline monitoring may also be required prior to construction or implementation of the project to provide a more substantive basis for defining the environmental management and monitoring plans.*

Ang paggamit ng paradaym na ang isang ECC ay isang tool sa pagpapalano ay higit pang inilarawan sa **Figure 3.1** kung saan inilalarawan na bago ang pagpapatupad ng proyekto na maaari lamang magsimula sa pag-secure ng isang ECC upang magpatuloy mula sa Philippine Reclamation Authority, ang ilang mga clearances ay kailangang ma-secure na nangangailangan ng isang ECC bilang input para sa paggawa ng desisyon ng iba't ibang ahensya sa pagbibigay ng mga clearances na ito.

ES 2.1 Uri ng Dokumento para sa ECC Application at Mga Generic na Nilalaman

Ang mga sumusunod ay mga uri ng dokumentasyon na itinala ng EMB/DENR ayon sa Revised Procedural Manual (RPM).

Table ES-2. Document Types for ECC Application and Generic Contents

Type of Document	Generic Contents
Environmental Impact Statement (EIS)	EIS is applied to Single New Projects covered by <ul style="list-style-type: none"> • Group I- Environmental Critical Project (ECP) in Environmental Critical Area (ECA) or Non-Environmentally Critical Areas (NECA) • Group II- Non-Environmentally Critical Projects in Environmentally Critical Areas, • Group IV- A co-located project is a group of single projects, under one or more proponents/locators, which are located in a contiguous area and managed by one administrator, who is also the ECC applicant. (EMB. 2007. page 7)

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Type of Document	Generic Contents
Environmental Performance Report and Management Plan (EPRMP) Programmatic EPRMP	For operating projects with previous ECCs but planning or applying for clearance to modify / expand or re-start operations, or for projects operating without and ECC but applying to secure one to comply with PD 1586 regulations. For single project applications EPRMP is the document to be submitted. For co-located project applications PEPRMP is to be submitted. (EMB. 2007. page 7 to 8)
Initial Environmental Examination Checklist (IEEC)	Groups I, II and IV depending on project type, location, magnitude of potential impacts and project threshold. (EMB. 2007. page 7)
Project Description Report (PDR)	The appropriate document to secure a decision from DENR/EMB. The PDR is a must requirement for environmental enhancement and mitigation projects in both ECAs and NECAs to allow EMB to confirm the benign nature of proposed operations for eventual issuance of a Certificate of Non-Coverage (CNC). (EMB. 2007. page 7)
Programmatic EIS (PEISS)	EIS is applied to Co-located Projects covered by <ul style="list-style-type: none"> • Group I- Environmental Critical Project (ECP) in Environmental Critical Area (ECA) or Non-Environmentally Critical Areas (NECA) • Group II- Non-Environmentally Critical Projects in Environmentally Critical Areas, • Group IV- A co-located project is a group of single projects, under one or more proponents/locators, which are located in a contiguous area and managed by one administrator, who is also the ECC applicant. (EMB. 2007. page 7) • PEISS more applicable for the Operations Phase

Makikita sa **Table ES-2** na ang Environmental Impact Statement (EIS) report ay isang pinaka angkop na dokumento para sa Konstruksyon / Reklamasyon Phase ng proyekto. Ang iba pang mga proyektong reklamasyon na ipinagkalooban ng Environmental Compliance Certificate (ECCs) ay ginamit din ang format ng isang EIS Document.

Proseso ng Dokumentasyon sa paghahanda ng EIA

ES 2.2 The EIA Team

Ang komposisyon ng EIA Team na may pagsunod sa EMB MC 2011-005 ay ipinapakita sa **Table ES-3**. Ang mga Expert Companies ay nakibahagi din at nakalista dito.

Table ES-3. EIA Team Composition

Team Member	Field of Expertise	EMB Registry No.	Company
Edgardo G. Alabastro, Ph.D.	Team Leader	IPCO-257	Technotrix Consultancy Services, Inc.
Nadia P. Conde	Project Coordinator	IPCO-102	Technotrix Consultancy Services, Inc.
Dr. Felixberto Roquia	Sociology Module	IPCO-028	
Hazel Victoriano	Socio Assistant	-	Technotrix Consultancy Services, Inc.
Benjamin Francisco	Marine and Fresh Water Ecology (Team Leader)	IPCO-038	Technotrix Consultancy Services, Inc.
Virgilio Pantaleon	Coral Reef, Seagrass	-	Technotrix Consultancy Services, Inc.
Engr. Emerson Darroles	Oceanography	-	Technotrix Consultancy Services, Inc.
Jose Rene Villegas	Marine Team	-	Technotrix Consultancy

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Team Member	Field of Expertise	EMB Registry No.	Company
Ernie Fontamillas	Marine Team	-	Technotrix Consultancy Services, Inc.
Michael Francisco	Fisheries	IPCO-040	Technotrix Consultancy Services, Inc.
Nazario Sabello	Air Quality	-	Technotrix Consultancy Services, Inc.
Jean Ravelo	Geology	-	Technotrix Consultancy Services, Inc.
Lawrence S Mojica	Technical Assistant	-	Technotrix Consultancy Services, Inc.
Angelie Faye Nicolas	Technical/Research	IPCO-259	Technotrix Consultancy Services, Inc.
Warren Conde	Field Survey	-	Technotrix Consultancy Services, Inc.
Proponent's External Expertise			
<ul style="list-style-type: none"> • Eng'r Manuuel R. Berenia = Reclamation Technology • Ms. Sujata Govada UDP International (H.K.) – Master Plan • Ramboll Group, Copenhagen. – Engineering • AMH Philippines, Inc. – Engineering • EGS (Asia) Inc. – Topographic and Bathymetric Survey • WSP Philippines, Inc. – Traffic Survey • Kwan Sing Construction Corp. – Geotechnical Survey/Borehole tests • Royal Van Oord - Reclamation & Dredging 			

ES 2.3 Iskedyul ng Aktibidad para sa EIA

Ang mga sumusunod ay ang mga aktibidad na isinasagawa para sa pag-aaral na ito. Ang mga susunod pang mga aktibidad ay magbabase sa Review Committee Meetings.

Table ES-4. EIA Study Schedule

ACTIVITY	DATE
▪ Secondary Data Researches	August 2018
▪ Marine Study	02 to 04 August 2017
▪ Bathymetric Survey	
▪ Geotechnical Survey	January to March of 2018. By A.M. Geoconsult
▪ Engineering Geological and Geohazard Assessment Report (EGGAR)	August 2018
▪ Geotechnical Survey (Drilling)	March 2018
▪ Preliminary Concept Masterplan and Engineering Design	03 August 2018
SOCIAL PREPARATION UNDERTAKEN	
ACTIVITY	DATE
IEC and Perception Survey (Public participation Documentation provided in Annex 3)	
▪ Initial Perception Survey	15-20 February 2018
▪ Information, Education and Communication (IEC)	26 January 2018
▪ Focus Group Discussion	27 June 2018
▪ Focus Group Discussion	17 July 2018
▪ Focus Group Discussion	26 July 2018
▪ Focus Group Discussion	27 July 2018
▪ Public Scoping	24 January 2019
▪ Technical Scoping	08 February 2019 (Technical Scoping Checklist provided in

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ACTIVITY	DATE
<ul style="list-style-type: none"> ▪ Perception Survey <ul style="list-style-type: none"> ✓ Barangay Banalo ✓ Barangay Maliksi I ✓ Barangay Maliksi III ✓ Barangay Sinaguelasan ✓ Barangay Talaba ✓ Barangay Zapote ✓ Barangay Kaingen ✓ Barangay Tabing Dagat ✓ Barangay Digmaan ✓ Barangay Alima 	<p>Annex 2)</p> <p>January to March 2019</p>

ES 2.4 EIA Methodologies

Ang mga sumusunod na pamamaraan ay isinasalang-alang sa pagtatag ng baseline information ng mga lugar na maaapektuhan ng proyektong ito:

Table ES-5. EIA Methodology

Module / Section	Baseline	Methodology
LAND		
Land Use Classification	Secondary data: Bacoor City Comprehensive Land Use Plan (CLUP). Bacoor City Zoning Ordinance	Assessment of compatibility of the proposed project in the land use classification, Manila Bay Coastal Strategy, Consistency with the PRA Implementing Rules and Regulations, Relation to the PRA Master Plan for Manila Bay
Geology	Secondary data: Geologic, seismic, liquefaction, slope hazard maps and evaluation based on government data and maps. Primary data: Borehole drilling by 3 rd party A.M. Geoconsult & Associates	Identify and assess project impact in terms of the changed in topography including existing hazard as maybe aggravated Conduct of EGGA. MGB Methodology
Pedology	Primary data: Geotechnical Investigation by A.M. Geoconsult & Associates	Describe the physical properties and erodibility potential of the soil, ongoing erosion processes and assess the erosional impacts of the project.
WATER		
Hydrology / Hydrogeology	Secondary data: Existing drainage system. Historical flooding occurrences	Identify and assess project impact on the change in drainage morphology, local drainage and resulting effects of flooding
Marine Water Quality	Primary data: Standard Methods for Water Quality Sampling and Monitoring. Water Body Classification: DENR Class SB Parameters Considered <ul style="list-style-type: none"> • BOD • Fecal Coliforms • COD • Lead • Total Coliforms 	Assess impacts on siltation of surface and coastal marine waters DAO 2016-08 Analytical Methods: by CRL Laboratory, recognized by DENR

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Module / Section	Baseline	Methodology
	<ul style="list-style-type: none"> Hexavalent Chromium Total Suspended Solids pH Oil and Grease DO Fecal Coliforms Nitrate Phosphate Arsenic Mercury Cadmium Color Chromium <p>Secondary data: BFAR Report on Manila Bay</p>	Metals : Spectrophometry AAS Cold Vapour AAS for Hg Coliform : Multiple Tube Fermentation BOD : Azide Modification Winkler O & G: Gravimetry (n-Hexane extraction) DO : Winkler/Titrametric pH : Electrometry TSS : Gravimetry
Oceanography	<p>Primary data: Tide Measurements 2/6/2018 – 19/6/2018. Bathymetric data</p>	Tidal Stations Echo sounder or equivalent
Marine	<p>Primary data: Abundance / density / distribution of ecologically and economically important species, mangroves, benthism plantons, coral reefs, algae, seaweeds, sea grasses</p> <p>Presence of pollution indicators</p>	Transect, manta tow and spot dives surveys, marine resource characterization (e.g. city/municipal and commercial fisheries data), Key informant interview. Microscopic Examination
AIR		
Ambient Air Quality	<p>Primary data: Ambient air quality sampling and testing.</p> <p>DENR Classification Ambient Air and Noise Classification: Class B – Commercial Area</p> <p>Parameters Considered: TSP, PM10, SO², NO²</p>	<p>Methodology: Standard Methods for Ambient Air Quality Sampling by Volume Sampler</p> <p>TSP: Gravimetric PM10: Gravimetric PM2.5: Gravimetric SO₂: Parossonline NO₂: Griess Saltzman Noise: Type 2 – Sound Level Meter</p>
Ambient Noise Quality	<p>Primary data: Noise Meter</p>	
Contribution in terms of GHG	<p>Data on Greenhouse Gases</p>	Estimation of projected greenhouse gasses (GHG)
PEOPLE		
<ul style="list-style-type: none"> Demographic Profile / Baseline 	<p>Primary data: Conduct of Public Perception Survey, Public Scoping Secondary data: Comprehensive Land Use Plan and Socio Demographic Profile of Bacoor City</p>	

ES 2.5 Pampublikong Pakikilahok

1. Information Education Communication (IEC) Activities

▪ IEC AND FGD WITH THE CONCERNED STAKEHOLDERS

Ang mga IEC activities ay isinagawa kasama ang mga concerned stakeholders noong 26 Enero 2018, 27 Hunyo 2018, 17 Hulyo 2018 at 26 Hulyo 2016. Ang mga imbitado sa nasabing mga IEC

activities ay Opisyal ng LGU, Mga Opisina ng Gobyerno, Mga Organisasyon ng Non-Pamahalaan (NGO) / Organisasyon ng Mga Tao (PO), Apektadong Barangays at iba pa. Ang mga Barangay Officials ay napag-alaman na ang kanilang mga barangay ay makikinabang sa mga oportunidad sa kabuhayan at trabaho na mabuo ng iminungkahing proyekto. Bukod dito, pinahalagahan ng mga opisyal ng barangay ang IEC bilang pagkakataon na mag-ukol ng mga isyu at puna. Ang pagpapupulong ay nagbigay ng background at pag-unawa sa ipinanukalang proyekto pati na rin ang mga potensyal na epekto na maaaring lumabas. Ibinigay sa ibaba ang mga pangunahing isyu na nakataas sa panahon ng Pre-IEC at FGD na isinasagawa.

Mga Pangunahing Isyu at Mga Alalahanin na itinaas sa panahon ng IEC na isinasagawa:

- Pagkakakilanlan ng developer partner ng Syudad ng Bacoor
- Problema sa Trapiko
- Saan kukuha ng panambak
- Kailan ang Public Scoping

▪ **PAUNANG SURVEY SA KOMUNIDAD NA MALAPIT SA LOKASYON NG PROYEKTO**

Ang mga resulta ng mga paunang survey na sumasakop sa komunidad na malapit sa lokasyon ng proyekto ay inilahad sa **Annex 3**. Ang mga nasabing mga survey ay isinagawa bilang bahagi ng Information, Education and Communication (IEC).

2. Aktibidad ng Pampublikong Scoping

Ang Public Scoping na isinagawa noong 24 Enero 2019 ay ginanap sa Bacoor City Hall Gymnasium at dinaluhan ng mga kalahok mula sa iba't ibang sector. Ang mga concerned stakeholders, lalo na ang mga kilala na may hadlang na pananaw sa mga proyekto ng reklamasyon, pati na rin ang mga matatagpuan sa mga lugar na apektado ay inanyayahang lumahok. Kabilang sa mga inanyayahan ay mga Opisyal ng LGU, Mga Opisina ng Gobyerno, Mga Organisasyon ng Non-Pamahalaan (NGO) / Organisasyon ng Mga Tao (PO), at iba pa. Sa kabilang banda, mayroon ding mga kalahok na hindi kasama sa opisyal na listahan ng mga inanyayahan ngunit dumalo sa nasabing pagscoping. Buod ng mga Kalahok sa panahon ng Pampublikong Scoping na ibinigay sa **Annex 3**.

Napansin na ang sapat na oras ay ibinigay sa mga inanyayahan. Para sa anumang mga indibidwal na dahilan siguro para sa kanilang kawalan ng kakayahan na dumalo, ang mga stakeholder ay patuloy na kinonsulta sa petsa para sa kanilang mga alalahanin, kung mayroon man. Ang mga Letters of No Objection (LONO) sa katunayan ay nakuha mula sa ilang mga ahensya tulad ng ipinapakita sa ibaba at nakalahad sa **Annex 1.7**.

- a. Department of Tourism (DOT) dated 19 November 2019
- b. Bureau of Fisheries and Aquatic Resources (BFAR) dated 20 November 2018
- c. Philippine Navy dated 27 November 2018
- d. Department of Energy (DOE) dated 29 November 2018
- e. Regional Development Council (RDC) dated 05 December 2018
- f. Philippine Reclamation Authority (PRA) dated 18 December 2018
- g. Department of Public Works and Highways (DPWH) dated 07 January 2019
- h. Department of Information and Communications Technology (DICT) dated 15 January 2019
- i. National Headquarters Philippine Coast Guard (PCG) dated 17 January 2019
- j. Philippine Ports Authority (PPA) dated 20 February 2019
- k. National Commission for Culture and the Arts dated 03 July 2019

Buod ng mga Isyu at Mga Alalahanin na Itinaas sa panahon ng Pampublikong Aktibidad

Ang pakay ng natapos na Public Scoping at mga susunod pang pagpapahayag sa publiko ay para tiyakin na ang EIS Report ay tutugon sa lahat ng agamgam ng mga tao at publiko.

Ang mga mahahalagang itinatong ay kung sino ang mga makikinabang sa mga housing programme, saan manggagaling ang kinakailangang panambak para sa bubuuing proyekto at ano ang magiging epekto sa mga mangingisda. Makikita sa ibaba ang mga naitaas na mga isyu tungkol sa proyekto.

Mga mahahalagang isyu noong Pampublikong Aktibidad

- Saan manggagaling ang panambak at ano ang epekto sa San Nicholas Shoal
- Ano ang magiging pekto sa mga mangingisda
- Makakaapekto ba sa pag ikot ng tubig karagatan
- Magkakaroon ba ng erosion
- Anong mga barangays ang maaapektuhan
- Magkakaroon ba ng daluyong o storm surge
- Tataas ba ang lebel ng Manila Bay
- May kinalaman ba a pagbabago ng Klima
- Paano ang mga basura
- Magdudulot ba ng mabigat na trapiko
- Ano ang magiging epekto sa 844 Hectare Cavite Reclamation Project
- Epekto sa LPPCHEA
- Epekto sa patakaran ng paglilinis at pagrerehabilita ng Manila Bay

Ang kumpletong Report ng Pambublikong Aktibidad ay makikita sa **Annex 3**.

ES 3.0 Buod ng EIA

ES 3.1 Summary of Alternatives

Ito ay tinatalakay sa **Section 1.3** kung saan ang mga parameters ay ang mga sumusunod:

Territorial Jurisdiction

- Ang lugar na napili ay hindi dapat maka apekto sa ECAs o Protected Areas na idineklara ng NIPAS lalo na ang LPP Wetland Park and mangrove communities.
- Hindi dapat maka apekto sa marine reources
- Must not conflict with existing settlers, or if with conflict resolutions can be developed.
- Isinasaalang alang ang mga posibleng reklamasyon sa hinaharap
There should be sufficient buffer zone between the site and these other projects.
- Dapat isaalang-alang ang City Resolution CR 2014-38 tungkol sa Aquaculture zone, fishing grounds at mangrove areas

The options for the appropriate landforms are also discussed in **Section 1.3**.

Ang landforms ng reklamasyon ay dapat isaalang alang ang epekto sa kailkasan, sirkulasyon ng tubig at sediment transport

Ang circulasyon, sediment transport at flood modellings ay ginawa para sa dalawang planong reklamasyon na Bacoor 320-ektarya at Diamond 100-ektarya at ni rerepresenta dito ang “worst” case scenarios. The impacts will obviously be much lesser if the Diamond 100-hectare project is taken singly and isolated from the other project.

ES 3.2 Summary of Main Impacts and Residual Effects after Applying Mitigation

Ang buod ng mahahalagang epekto ay makikita sa **Table ES-12**.

Table ES-6. Summary of Main Impacts and Residual Effects

Activity / Resources Likely	Potential Impact	Options for Prevention or Mitigation* or Enhancement	Residual Effects
I. PRE-CONSTRUCTION PHASE			
Site Clearing	Displacement of lift nets and mussel farms	<ul style="list-style-type: none"> Avoidance or Thru agreements with fisherfolks 	Nil. Affected fisherfolks are provided with fair and agreed compensation.
	Displacement of Existing Properties		
	Displacement of established fishing areas within the proposed site		
II. CONSTRUCTION PHASE			
Dredging and Reclamation Phase	Impacts on ECA	Not Relevant ECA distant from site	Nil
	Solid Waste Generation	<ul style="list-style-type: none"> Domestic garbage from construction crews segregated and collected onboard ship and disposed onshore per RA 9003. No garbage disposal to Manila Bay. Inventory of solid wastes, principally garbage through records of amount of garbage 	Nil
	Disturbance of Marine Species Silt Dispersal	<ul style="list-style-type: none"> Provision of silt curtains where sediment streams are likely to occur and escape. Installation of silt and sediment weirs around reclamation equipment and barges; Monitoring of sediment fluxes and application of more stringent control measures when necessary; or temporary cessation of activities. Sediment canals in reclaimed areas will be installed to divert sludge into filters and weirs that capture sediments and fugitive reclamation filling materials at source. 	Nil after all appropriate mitigating measures
Land Stabilization	Inducement of natural hazards such as floods, subsidence, liquefaction, tsunami, storm surge, land subsidence	<ul style="list-style-type: none"> Reclamation Platform itself with wave deflector gives sheltering effect. Appropriate structure to be selected in DED stage. Current best option is the use of wave deflector for tsunamis/storm waves; soil compaction/stabilization for liquefaction & subsidence; sufficient drainage system & retention/storage areas for floodwaters, among others. Structural defense options are: seawalls at breakwaters wave deflectors, other similar defenses such as revetment; angled bypass 	Nil Reclamation will not cause floods, subsidence, and other natural hazards

Proposed Diamond Reclamation and Development Project (100-Hectare)
City Government of Bacoor
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Activity / Resources Likely	Potential Impact	Options for Prevention or Mitigation* or Enhancement	Residual Effects
		<p>walls.</p> <ul style="list-style-type: none"> Monitoring of ground level will be done during the period of soil stabilization (before vertical development) to determine quantitative surface movements with respect to both spatial and temporal rates. Design of evacuation routes Public education, awareness and preparedness campaign to include each of the known hazards. This will include evacuation drills, placing of signage, and establishing alert systems. This will be done in coordination with agencies like NDRRMC, PHIVOLCS, PAGASA, Project NOAH, etc. vis-a-vis the Disaster/Risk Reduction and Management Plan of the government. 	
	Soil Erosion	<ul style="list-style-type: none"> To prevent erosion on the seaward portion of the project, the construction of the seawalls shall be implemented in the initial phase of the reclamation. Consideration shall be given to forming a bund after the construction of the sea wall and placement of filter material, using selected granular material where possible, along the line of and immediately behind the sea wall. Such a bund assists in stabilizing the sea wall and its foundation if mud waves occur during filling. 	Nil
Dredging and Reclamation Phase	Changes in Seabed properties	<ul style="list-style-type: none"> Reclamation technology to minimize seabed soil removal e.g. by maximum reuse of existing through surcharges derived from SNS; possible use of sand bag technology, etc. 	Nil
	Perceived Permanent loss of 320 Hectare Manila Bay Waters of the City of Bacoor, Change in Bathymetry		Permanent residual effect
	Change in water circulation	<ul style="list-style-type: none"> Final design and alignment of landform to be based on the mathematical modeling for the landform layout. Will include in modeling other approved projects. 	Minimal
	Disruption in water circulation pattern and coastal erosion and deposition		Minimal
	Overall impact on whole Manila Bay circulation pattern and dispersion behaviours of existing outfalls and discharges		Nil
	Inducement of Flooding	<ul style="list-style-type: none"> Project will not block or disturb existing drainage system 	Nil
Degradation of marine water quality	<ul style="list-style-type: none"> Silt curtains and containment structures Pre-screening of filling materials; most possible source is from Manila Bay (San Nicolas Shoal) itself Install liquid waste management system ensuring modern waste retrieval and treatment system. Treatment and disposal of liquid waste at point source will involve collecting liquids of point source origin; 	Nil	

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Activity / Resources Likely	Potential Impact	Options for Prevention or Mitigation* or Enhancement	Residual Effects
		<p>directing waste into integrated multiple waste streams facilities or collecting vessels, and application of treatments. Any fluid effluent to be discharged at sea will be monitored and tested before discharging.</p> <ul style="list-style-type: none"> • Installation of latrines and waste receptacles; collection facilities; • Collection of shipboard wastes. • Adoption of clean practices by all project operating units and personnel; • Implementation of an efficient waste retrieval system; • Greening of reclamation area. • Adoption of an oil and grease recovery and treatment system; • Implementation of rigid policies against indiscriminate disposal of oily waste and marine vessel bilge water. 	
	Threat to existence and/or loss of important local species and habitat	<ul style="list-style-type: none"> • Support appropriate stock enhancement measures e.g., re-seeding of appropriate species; • Support closed seasons to enhance reproduction capacity of sardines and recruitment of stocks. • Provision of alternative livelihoods to affected fishers 	Nil after applying mitigating measures
	Sea Level Rise	<ul style="list-style-type: none"> • Elevated platform is a mitigating measure 	Nil
	Potential accidents and damages to marine ecosystems during transport of dredging vessel	<ul style="list-style-type: none"> • Sea worthy vessels • Navigational Devices • Proper training • Avoid transport during inclement weather • Compliance with PCG and International regulations 	Nil
Horizontal Development	Fugitive Dust Generation from construction equipment and vehicles	<ul style="list-style-type: none"> • Construction Methodology 	Nil
	Increase of Ambient Air and Noise Quality	<ul style="list-style-type: none"> • Construction works distant from ESRs • Short term only • Sea is buffer zone itself to population onshore 	Nil
	Emissions if power generating sets used and fossil fuel using equipment	<ul style="list-style-type: none"> • Proper preventive maintenance of gensets; replace leaking valves, fittings, etc. 	Nil
Land Stabilization	Livelihood and employment opportunity	<ul style="list-style-type: none"> • Positive effects of the proposed project 	Long term positive impacts/enhancement

In summary, with respect to natural hazards, the major impacts on the land environment would be the inducement of natural hazards. Reclaimed lands in general, are considered **prone to liquefaction**; however, engineering and reclamation methodology interventions will be applied. In addition, the project site, being located along the coast of Bacoor Bay, is **susceptible to tsunami hazard** due to the presence of an active subduction zone – Manila Trench located 190km west of the area and other active faults and or earthquake generators. Furthermore, the reclamation project site would be underlain by fill materials that are highly compressible which makes it prone to **subsidence hazard**. Engineering intervention will, however, be applied. Likewise, the project

area falls within the delineated flood prone areas by MGB indicating that the project could experience flooding if sea level rises by <5 meters. Considering the flat terrain and average elevation of the coastal areas of about two (2) masl, the project site could **experience localized flooding** especially if the drainage systems are inadequate. The vulnerability of the project site to **storm surges will be addressed by design and engineering interventions.**

Para sa epekto sa katubigan, ang pangunahing epekto nito ay ang paglabag sa City Ordinance ng Aquaculture, Fishing at Mangrove Zones. Ito ay malulutas at maisasaayos sa pamamagitan ng relocation with fair compensation packages at pagbabago o pagsasaayos ng bagong City Ordinance.

Para sa epekto sa hangin, ang polusyon sa hangin ay hindi gaanong maaapektuhan sa kadahilanang ang mga aktibidad o konstruksyon ay nasa dagat at malayo ito sa mga tinatawag na Environmentally Sensitive Receptors (ESRs).

Para sa epekto sa mga tao, ang paglipat ng mga lift nets, tahungan at paglipat ng mga existing properties at displacement of established fishing areas within the proposed site during the pre-construction phase.