

NON-TECHNICAL SUMMARY

ENVIRONMENTAL AND SOCIAL IMPACTS OF SAND EXTRACTION AT SAN NICOLAS SHOALS FOR DEVELOPMENT OF NEW MANILA INTERNATIONAL AIRPORT

The New Manila International Airport (NMIA) will be developed to serve Metro Manila as well as the neighbouring regions of Central Luzon and the Calabarzon region in Southern Luzon.

It represents a long-term solution to air traffic congestion in the country's capital, which has long hindered economic growth and compounded many transportation-related problems. It also addresses the Philippines' urgent need for a new international gateway with sufficient capacity to serve present and future demand. The current major gateway, Ninoy Aquino International Airport has reached its maximum runway capacity, and has limited scope for expansion.

The NMIA will be located in a 2,565 ha area in the Municipality of Bulakan, Province of Bulacan, north of Metro Manila. The area shall be a mixed-use development and will include various components such as airfield facilities, terminal building, airport and airline support facilities, access roads, parking facilities, utilities, airport city, and other ancillary facilities. It will be accessible from Metro Manila and Luzon provinces via a master planned infrastructure network.

It will be developed in phases, with an initial capacity of 35 million passengers annually, and a target of 100 million passengers per year, once fully implemented.

On 18 September 2019, the Department of Transportation issued a 50-year Concession Agreement for the financing, construction, operation and maintenance of the Airport to San Miguel Aerocity Inc. (SMAI). The construction of the Airport will comprise the following components, of which SMAI contracted Boskalis Philippines Inc. to undertake the first three components.

1. Dredging of Access Channel to the Land Platform and disposal of dredged materials generated in a designated Offshore Disposal Area
2. Sand Extraction from San Nicolas Shoals
3. Development of Land Platform with extracted sands
4. Construction of Airport infrastructure on land platform

SMAI has committed to develop the Project according to both local Philippine regulations and good international industry practice, including the assessment and management of impacts on the environment and local communities.

Environmental Impact Statements have been developed and Environmental Compliance Certificate and Mining Permit have been obtained for 5,000 hectares, and similar documents are being obtained for additional area according to Philippine requirements.

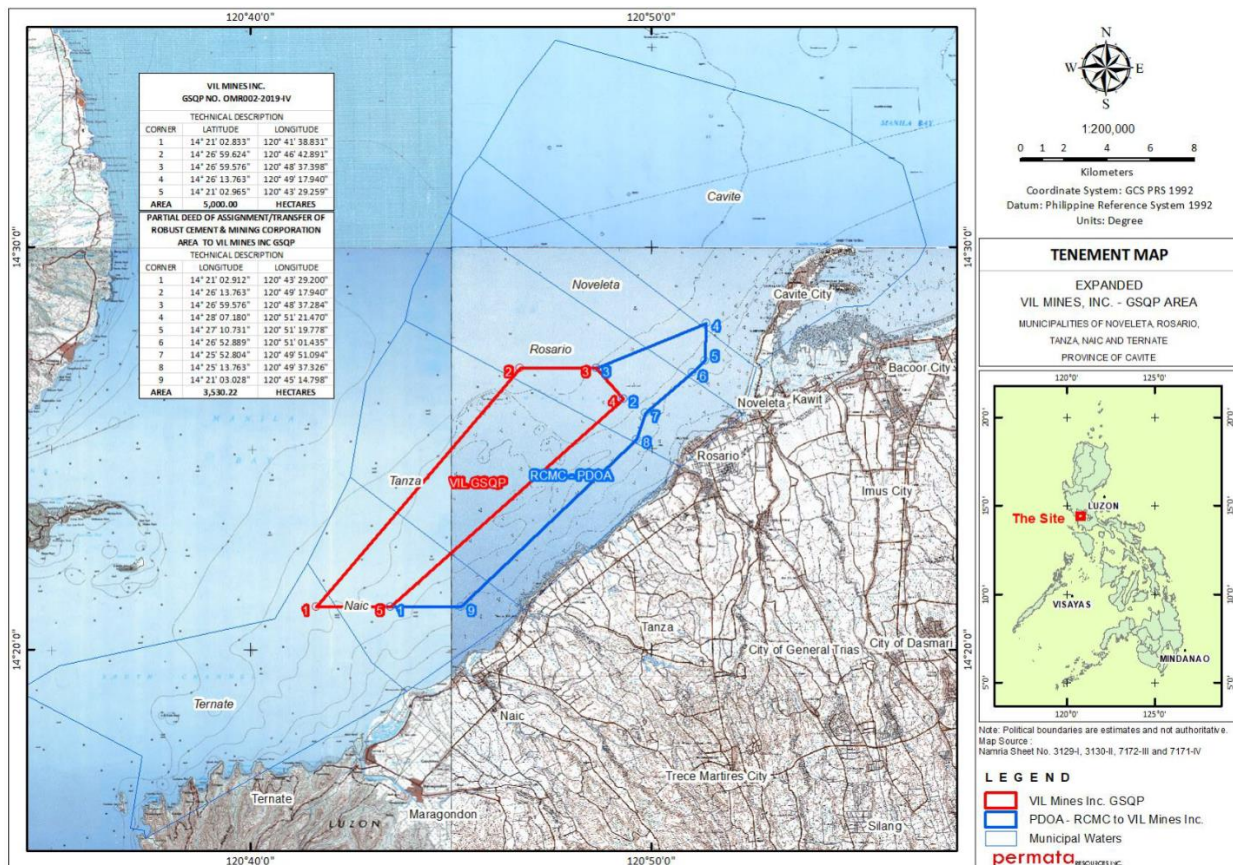
In addition, various Environmental and Social Impact Assessments (ESIA) to international standards have been prepared for the activities. The independent consultancy ERM Limited prepared an Environmental and Impact Assessment of the activities related to Sand Extraction at San Nicolas Shoals.

This Non-Technical summary presents the findings of this Environmental and Social Impact Assessment in a form that is accessible to all Project stakeholders.

The summary includes:

- Project description of Sand Extraction at San Nicolas Shoals;
- Information on the existing environment and local communities;
- Assessment of the expected impacts of the Project; and
- Measures to avoid and minimise adverse impacts on the environment and community, protect and enhance the environment, and support social development and restore livelihoods.

Project Description

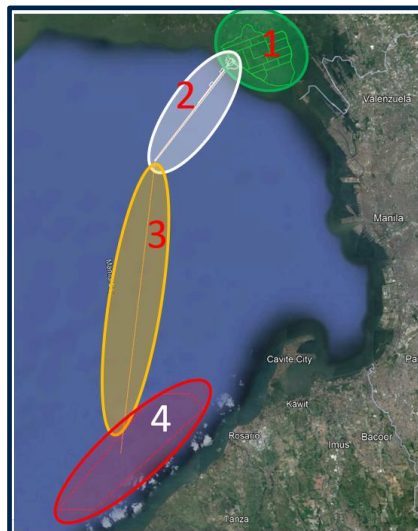


The San Nicolas Shoals Sand Extraction Project is located in Manila Bay, off Ternate, Naic, Tanza, Rosario and Novelata Municipalities and will cover approximately 5,000 hectares with a proposed expansion of 3,530 hectares.

Approximately 155 million m³ of sand will be extracted by up to four large 'Hopper' dredging vessels on a 24 hours per day, 7 days a week basis for about two years.



During the dredging the suction pipes of the dredging vessels are lowered to the seabed, the dredge pumps are started and dredging commences. When loaded, the dredging vessels will sail to the land development site.



1. Land Development;
2. Access Channel;
3. Approximate Sailing Route;
4. San Nicolas Shoals Dredging Area.

Current Environmental Conditions in Project Area

- Manila Bay is a relatively sheltered low energy environment with seabed consisting clayey-muddy sediment deposits. 61 sediment samples from the Project Area show mostly sandy sediments with shell fragments with variable gravel and fines content.
- Baseline water quality data collected from Project Site and surrounds showed variable water clarity conditions with total suspended solids concentrations found to range from 3 to 71 mg/L. Water samples collected in the baseline survey generally complied with Philippines Water Quality Guidelines, except for dissolved oxygen. Nutrient concentrations were found to be elevated and consistent with reports that waters in Manila Bay are eutrophic (nutrient-rich).
- There are no internationally or nationally recognized protected areas within the project area. The locally established Rosario Marine Protected Area (MPA) designated in 2015 by the LGU partly overlaps with the northern part of the Project area. Given Environmental Compliance Certificate (ECC) and Dredging Extraction Permit are in place, DENR considers the use of the project area to source sand compatible with the MPA. However, further consultation with the LGU about the MPA will confirm if additional measures may be required.
- Fish surveys at 16 locations spanning Manila Bay show the majority of the fish were immature individuals, which indicates over-fishing.
- Sampling of sea bed at 18 locations revealed a patchy abundance, high variability and low diversity of dominated by bivalves with other fauna including ribbonworms, marine snails and crustaceans. No species of conservation concern were recorded.
- Seagrass beds were not observed in the Project Area.
- Hard corals were observed at four locations as scattered, isolated, mostly small, individual colonies attached to rocks and rubble and no reef development was observed.

Current Social Conditions in Project Area

- Fishing is both socially and culturally important in the Philippines, however its significance for the national economy is declining. There is municipal fishing from coastal barangays from Ternate, Naic, Tanza, Rosario and Noveleta. No stationary fishing structures were initially observed (e.g. baklads) but few fishing nets were identified during the social baseline. Commonly caught fish species include: Law-Law (Sardine); Cabayas (Mackarel); Bisugo (Brems); Shrimp; Alimasag (Crab); Squid; Espada (Hairtail); Bagoong (Anchovies); Asuhos (Whiting); Sap-Sap (Ponyfish).
- The Province of Cavite is a popular tourist destination and attracts visitors both domestic and international, including its coastal resorts.
- No cultural heritage was identified during surveys.

Environmental and Social Impacts and Proposed Mitigations

Potential Impacts	Impact Significance Prior to Mitigation Measures	Residual Impact Significance	Mitigation Measures
Impacts on Water Quality from Capital Dredging Works	Moderate	Minor	<ul style="list-style-type: none"> ■ Dredging vessels will be equipped with the appropriate global positioning system (GPS) equipment or other navigational aids to ensure dredging will occur at the specified dredge footprint; ■ Hoppers will be filled to a level, which ensures that sediment does not spill over during transport to the filling site. This also minimises decks being washed by wave action; ■ The dredging should be planned to prioritise sediment deposits with lower fines content wherever possible so as to reduce overall dredged volumes and potentially the footprint of the Project in order to reduce the direct disturbance to the seabed and indirect effects from turbidity plumes. ■ Control and monitoring systems will be used to alert the crew to leaks or any other potential risks. ■ Implement standard turbidity controls including: ■ Turbidity near the dredging area or surrounding fixed points will be monitored during the dredging process ■ The dispersal of suspended sediment from the dredging vessels will be reduced and necessary mitigation will be taken in case that the turbidity concentration value is over the Department of Environment and Natural Resources (DENR) Water Quality norms. ■ Disposal vessels should be fitted with tight bottom seals in order to prevent leakage of sediments during transport.

Potential Impacts	Impact Significance Prior to Mitigation Measures	Residual Impact Significance	Mitigation Measures
			<ul style="list-style-type: none"> After dredging, any excess materials will be cleaned from decks and exposed fittings (not washed overboard) before the vessel is moved from the dredging area. Dredgers will maintain adequate clearance between vessel hull and the seabed at all states of the tide and reduce operations speed to ensure that excessive turbidity is not generated by turbulence from vessel movement or propeller wash.
Impacts on Seawater Quality from Routine Offshore Discharges from Vessels (Sewage and Sullage)	Negligible	Negligible	<ul style="list-style-type: none"> Sewage and sullage discharges will comply with the MARPOL requirements: <ul style="list-style-type: none"> Vessels will have valid International Sewage Pollution Prevention Certificate; Vessels within 3 nm of the nearest land will be required to either treat their sewage in a MARPOL approved treatment plant before discharge or collect their sewage for disposal outside of the 3 nm boundary. Outside of 3 nm sewage will be macerated to <25 mm before discharge. Sewage, which is not comminute or disinfected has to be discharged at a distance of more than 12 nm from the nearest land.
Impacts on Seawater Quality from Routine Offshore Discharges from Vessels (Deck Drainage and Bilge-water)	Negligible	Negligible	<ul style="list-style-type: none"> Preventative management measures will be implemented to avoid unintentional contaminated bilge water and deck drainage discharge; Vessels will comply with applicable MARPOL requirements including: <ul style="list-style-type: none"> Vessels will have valid International Oil Pollution Prevention certificate, as appropriate to vessel class;

Potential Impacts	Impact Significance Prior to Mitigation Measures	Residual Impact Significance	Mitigation Measures
Impacts on Seawater Quality from Hazardous and Non-Hazardous Waste Generation	Negligible	Negligible	<ul style="list-style-type: none"> - Bilge water contaminated with hydrocarbons must be contained and disposed of onshore, or treated appropriately on board; - Vessels will maintain an oil record book; - No direct overboard drainage from sludge/drain/dirty oil/bilge water collecting tanks. ■ Contaminated drainage from decks, machinery spaces or bunded areas will be contained and treated prior to discharge. ■ If treatment systems are not available or cannot meet the oil-in-water content specification, the contaminated water will be stored in suitable containers and transported to shore for treatment and/or disposal by a certified waste oil disposal contractor. ■ Extracted hydrocarbons from oil-in water separator systems will be stored in suitable containers and transported to shore for treatment and/or disposal by a certified waste oil disposal contractor. ■ Vessels will comply with applicable MARPOL requirements including: <ul style="list-style-type: none"> - Vessel Waste Management Plan (or equivalent) must contain as a minimum: <ul style="list-style-type: none"> • Waste handling equipment, waste storage containers, and spill response equipment appropriate to the type and volume of waste will be provided at waste storage areas. • All hazardous wastes will be segregated prior to onshore disposal.

Potential Impacts	Impact Significance Prior to Mitigation Measures	Residual Impact Significance	Mitigation Measures
Seabed Features / Profile / Erosion	Negligible	Negligible	<ul style="list-style-type: none"> • General non-hazardous waste (excluding food) and hazardous waste will not be disposed of to sea. • Vessels >400 tonnes (or certified for >15 persons on-board) will have a garbage record book. • Where safe and practicable to do so, lost objects will be recovered. • Any accidental release of foreign material to the marine environment that does not meet MARPOL discharge standards will be reported if required to relevant Authorities. <p>Mitigation and management measures for food and putrescible wastes, are detailed as follows:</p> <ul style="list-style-type: none"> ■ Vessels will comply with applicable MARPOL requirements including: <ul style="list-style-type: none"> - Food scraps will be macerated to a diameter of less than 25 mm prior to overboard disposal. - Macerated food scraps will be discharged greater than 3 nm from land. Within 3 nm food scraps will be collected and either transferred onshore for disposal, or disposed via maceration outside the 3 nm boundary. ■ Dredging vessels will be equipped with the appropriate global positioning system (GPS) equipment or other navigational aids to ensure dredging will occur at the specified dredge footprint.

Potential Impacts	Impact Significance Prior to Mitigation Measures	Residual Impact Significance	Mitigation Measures
Biological Environment – Impacts to Nearshore Benthic Communities due to Direct Loss of Habitat from Capital dredging operations	Minor	Minor	<ul style="list-style-type: none"> ■ Dredging vessels will be equipped with the appropriate global positioning system (GPS) equipment or other navigational aids to ensure dredging will occur at the specified dredge footprint.
Biological Environment – Impacts of Dispersion and Deposition of Suspended Sediments from Capital Dredging Operations to Nearshore Benthic Communities, Plankton and Fish and Protected Areas	Minor	Minor	<ul style="list-style-type: none"> ■ Measures recommended to reduce water quality impacts will also serve to reduce impacts to ecology resources
Biological Environment - Impacts to marine mammals, marine turtles, seabirds and shorebirds due to generation of sound from dredging	Negligible	No residual impact	<ul style="list-style-type: none"> ■ N/A
Biological Environment – Impacts to seabirds and shorebirds, marine turtles and marine mammals due to artificial lighting on dredging vessels	Negligible	Negligible	<ul style="list-style-type: none"> ■ Vessels will be lit sufficiently for safe working during 24 hour operations. Unless required to support overboard activities (re-fuelling etc.), lighting on vessels is directed to the work area, which aids in limiting light spill to sea. ■ Opportunities for light spill to be reduced (e.g. re-directing vessel lights inboard) will be managed through opportunistic inspections during vessel audits/inspections. The inspection will confirm deck safety lighting is fulfilling its purpose, without unnecessary light spill vertically to the water column, or horizontally. Any non-conforming lighting will be identified within the audit for corrective action.
Air Quality / Climate Change	Negligible	Negligible	<ul style="list-style-type: none"> ■ Low sulphur fuel will be used where available;

Potential Impacts	Impact Significance Prior to Mitigation Measures	Residual Impact Significance	Mitigation Measures
Airborne Noise	Negligible	Negligible	<ul style="list-style-type: none"> ■ Engine maintenance to minimise emissions of unburned hydrocarbons; ■ Vessels will be in compliance with applicable MARPOL Regulations for the prevention of air pollution from ships ; and ■ Vessels will have a Ship Energy Efficiency Management Plan providing for fuel efficient vessel operations, in accordance with the requirements MARPOL. ■ Only well-maintained equipment should be operated on-site; ■ Regular maintenance of equipment such as lubricating moving parts, tightening loose parts and replacing worn out components should be conducted; ■ Machines and construction plant items that may be in intermittent use should be shut down or throttled down between work periods; and ■ The number of equipment operating simultaneously should be reduced as far as practicable;
Fisheries and Livelihoods – Impact on Municipal Fishing and Fishing Nets	Moderate	Minor	<ul style="list-style-type: none"> ■ No exclusion zone will be established; ■ As per national regulations a minimum of 1.5% of the projected 5-Year Operating Cost of the San Nicolas Shoal Seabed Quarry Project shall be allotted for the implementation of the Social Development and Management Plan (SDMP). This plan includes a series of social development programs, such as community capacity building, college scholarship and other educational assistance,

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			<p>livelihood programs, enterprise development, assistance to infrastructure development and support services;</p> <ul style="list-style-type: none"> ■ Community safety vessels will be deployed around the area of dredging operations, to ensure safe fishing conditions of fishermen who are present around the dredging area and maintain a safety distance (500 m from dredging vessels). The safety patrol vessels could act to move fishnets deployed in the way of dredging vessels to prevent damage. ■ Assign delegated Community Liaison Officers onsite to keep communication with potentially affected fishermen and to inform communities about the schedule and location of dredging activities on a regular basis, understand and record their concerns, and address eligible concerns raised during such consultation per the Grievance Mechanism; ■ Disclose the operation plan to inform fishermen and fishing net owners of the working area and disclose vessel routes on a regular basis, so as to ensure people will not place the fishing net in the working area of dredgers; ■ Disseminate and implement a grievance mechanism for people to provide feedback or complaints about the Project (including anonymous complaints if preferred) and to obtain a response; and ■ Implement an unforeseen Damage Compensation Framework linked to the Community Grievance Mechanism so that any damage to equipment, boats, fish gear etc. directly attributable to activities of the Project and/or its contractors can be compensated.

Potential Impacts	Impact Significance Prior to Mitigation Measures	Residual Impact Significance	Mitigation Measures
			<ul style="list-style-type: none"> ■ A Livelihood Restoration Plan has been developed, which will fall under the umbrella of the Social Development and Management Plan (SDMP). The extent and scale of economic impact on municipal fishermen are evaluated and livelihood restoration programmes are proposed: <ul style="list-style-type: none"> - Consult with and inform municipal fishermen and other relevant households regarding the livelihood restoration measures; - Execute appropriate livelihood restoration programmes (e.g. Aquaculture and Fishery Capacity Building Program, Skills Training Program, Preferential Employment Program, and sustainable fishery plan) to improve or at least maintain the livelihoods of municipal fishermen; - Pay particular attention to vulnerable groups and, if necessary, implement measures to ensure that they have equitable access to opportunities and benefits provided by the Project; - Ensure gender equity in all livelihood restoration measures; - Include livelihood monitoring; ■ Develop employment programmes: the Project will require the communication of operational updates, safety distance from vessels and dredger working area between marine users. This program will maximise the benefit sharing between the Project and affected fisherfolk by hiring a liaison role locally. ■ Execute livelihood monitoring to monitor livelihood changes. If it is identified that the livelihoods have been adversely affected by the

Potential Impacts	Impact Significance Prior to Mitigation Measures	Residual Impact Significance	Mitigation Measures
Fisheries and Livelihoods – Impact on Value Chain of Fishery			<p>Project, supplementary livelihood restoration measures should be proposed and implemented;</p> <ul style="list-style-type: none"> Close the livelihood restoration activities upon confirmation that livelihoods impacts induced by the Project have been mitigated in line with the applicable standards, as demonstrated in a completion audit including a socio-economic survey; Promote sustainable development of fish resources; Regularly monitor the yield of fish caught by affected fishermen during the period of sand winning activities; and Support existing initiatives and programs.
	Minor	Negligible	<ul style="list-style-type: none"> Baseline Assessment and implementation of Livelihood Restoration Programs, regularly monitor the yield of fish caught by affected fishermen; and If the fish catch yield is reduced significantly due to sand winning activities, further action shall be undertaken to improve/restore fish stock in the Project influence area.
Perception of Erosion	Moderate	Minor	<ul style="list-style-type: none"> Ensure the sand borrow activities are undertaken within the designated area; Disclose and implement the Grievance Mechanism for the Project, and investigate any raised grievances in time; Disclose the non-technical summary of the sedimentation and erosion impact assessment for sand borrow area;

Potential Impacts	Impact Significance Prior to Mitigation Measures	Residual Impact Significance	Mitigation Measures
Marine Traffic	Moderate	Minor	<ul style="list-style-type: none"> ■ Set up a focal point to explain and clarify any queries raised from potential affected stakeholders regarding coastal erosion; ■ Ongoing engagement with Barangays and resort owners who have such concerns to alleviate their worries and anxiety; ■ Collect the baseline situation of the coastlines near the Project Site by satellite images; and ■ Continuously monitor (e.g. using satellite imagery) the change of coastlines adjacent to the Project during and after sand winning. If any erosion impacts are identified due to sand winning activities (natural/anthropogenic phenomena shall be excluded), corrective actions should be proposed and implemented to mitigate such impact. ■ Crewmembers will be trained to understand the Project Health, Safety, Security and Environmental policy and requirements; ■ All works executed within the boundaries of the Project area with main vessels and auxiliary equipment may only start upon approval of Port Control; ■ Instructions of Port Control will be strictly followed at all time; ■ No exclusion zone will be imposed besides the safe distance of 500m from dredging vessels; ■ Navigational warnings received are taken into account by the vessels' management while planning the routes; ■ Maritime safety notifications will be communicated with the vessels sailing in the Bay during transportation of sand materials;

Potential Impacts	Impact Significance Prior to Mitigation Measures	Residual Impact Significance	Mitigation Measures
Community Exposure to Disease	Moderate	Minor	<ul style="list-style-type: none"> ■ Disclose the operation plan to inform fishermen and fishing net owners of the working area and vessel routes on a regular basis, to ensure people will not place the fishing net in the working area of dredgers; ■ Community safety vessels will approach vessels and steer them away from safety buffer zone during operation; ■ Disclose and implement the Grievance Mechanism for the Project, and investigate any raised grievances in time; ■ All accidents, damage and near misses are reported; ■ Implement unforeseen damage compensation procedure linked to grievance mechanism; ■ Safe navigation practices will be adhered to; ■ Provide safety training for fishermen; and ■ Project vessels should be clearly illuminated and equipped with speakers and steer away of large ships. ■ Staff should stay at home if symptoms of cold occur; ■ Do not shake hands; ■ Keep a social distance of 1.5 m, or more if prescribed by local regulations; ■ Wash hands often with soap and water (at least 20 seconds) and use hand sanitizer;

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Spills and Leaks	Minor	Minor	<ul style="list-style-type: none"> ■ Cough or sneeze into elbow or cover mouth and nose with a tissue and place the used tissues immediately in a bin and wash your hands afterwards; ■ Visitor must adhere to COVID Outbreak Management System visitor requirements and obtain approval from Vessel Captains prior to embarking a vessel; ■ For circumstances of medical evacuations, the Vessel Captain shall inform the Project HR and Crewing Manager to maintain communications with necessary personnel outside of the project; ■ Conduct COVID tests on-board regularly; and ■ Encourage all Project employees take full vaccination prior to mobilisation ■ Preparation and implementation of vessel standard operating procedures. ■ Adherence to MARPOL regulations: <ul style="list-style-type: none"> - Vessels will hold a valid International Oil Pollution Prevention Certificate. - Vessels will maintain an oil record book. ■ Shipboard Oil Pollution Emergency Plans will be developed and kept on-board vessels. ■ Chemicals and/or hydrocarbons will be handled and stored in compliance with the Material Safety Data Sheet.

Potential Impacts	Impact Significance Prior to Mitigation Measures	Residual Impact Significance	Mitigation Measures
			<ul style="list-style-type: none"> ■ All chemical and/or hydrocarbon wastes will be segregated into clearly marked containers prior to onshore disposal by a licensed waste management contractor. ■ Spill response kits will be located in proximity to hydrocarbon storage/bunkering areas and appropriately stocked/replenished as required. ■ Standard maritime safety/navigation procedures will be implemented including: <ul style="list-style-type: none"> - Adhere to steering and sailing rules including maintaining look-outs (e.g. visual, hearing, radar etc.), proceeding at safe speeds, assessing risk of collision and taking action to avoid collision (monitoring radar). - Adhere to navigation light display requirements, including visibility, light position/shape appropriate to activity. - Adhere to navigation noise signals as required. - Adherence to minimum safe manning levels. - Maintenance of navigation equipment in efficient working order (compass/radar). - Automatic Identification System (AIS) installed as required by vessel class. ■ Establishment of 500m Safety Zone around each dredging vessel during active operations.

Potential Impacts	Impact Significance Prior to Mitigation Measures	Residual Impact Significance	Mitigation Measures
Invasive Marine Species	Minor	Negligible	<ul style="list-style-type: none"> ■ Adherence to the International Convention for the Control and Management of Ships' Ballast Water and Sediments, as relevant, including <ul style="list-style-type: none"> - Manage ballast water and sediments according to a ship-specific ballast water management plan - Ships will have a valid international ballast water management certificate - Vessels to maintain records of ballast water uptake and discharge locations in Ballast Water Record Book
Collisions	Moderate (fauna)	Minor (fauna)	<ul style="list-style-type: none"> ■ Briefings to vessel contractors should be conducted regarding presence of marine mammals, sea turtles and whale sharks in the vicinity of the Project Site and the procedures to adopt upon sighting of these species to avoid collision. ■ Crew on dredging vessels will be trained to watch for marine megafauna with naked eye and aided by binoculars and will monitor for marine megafauna continuously in the borrow area during daylight hours, as far as practicable. They will also watch for fishing vessels to avoid collisions. ■ Any sightings of marine megafauna will be reported if they impose a risk to one or more vessels, including location where the animal was sighted and direction. ■ All sightings will be recorded in a Marine Megafauna Observation Log Sheet.

Potential Impacts	Impact Significance Prior to Mitigation Measures	Residual Impact Significance	Mitigation Measures
			<ul style="list-style-type: none"> ■ Dredging vessels will adhere to good industry marine megafauna interaction protocols, where safe to do so, as follows: <ul style="list-style-type: none"> - Dredging vessels during sailing/dredging will not intentionally approach within 300 m of whales or within 150 m of dolphins; - Dredging vessels during sailing/dredging will not approach from an angle of less than 60° into or away from the direction of travel of the marine megafauna; - Dredging vessels during sailing/dredging will not encourage bow-riding of mega-fauna. Should any marine megafauna commence bow riding in front of a vessel, the vessel master will not change course or speed suddenly, as long as vessel safety is not compromised; and - Dredging vessels during sailing/dredging vessels will slow down to no-wake speeds when within 300 m of marine megafauna, if possible and safe to do so.
	Negligible (vessels)	Negligible (vessels)	<ul style="list-style-type: none"> ■ Every crew member will be trained to understand the Project Health Safety Security and Environmental requirements; ■ All works executed within the boundaries of the Project with main vessels and auxiliary equipment may only start upon approval of Port Control. The instructions of Port Control will be strictly followed at all times; ■ Navigational warnings received from the Control & Marine Guidance Office are taken into account by the vessels' management while planning the route;

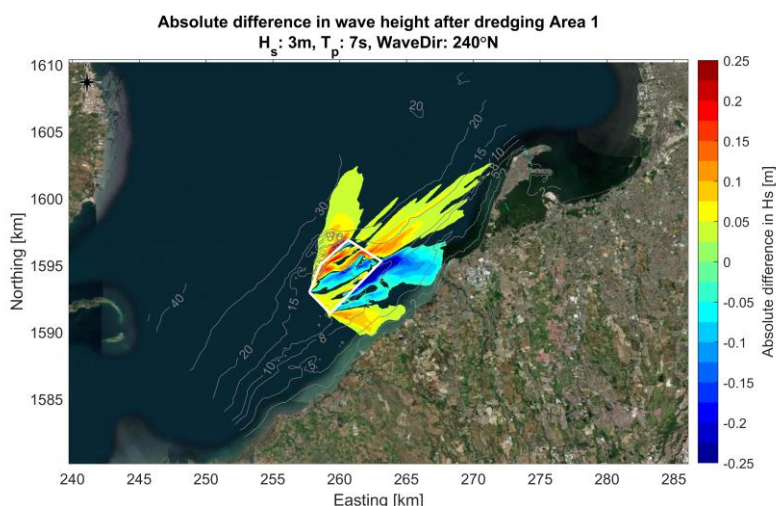
Potential Impacts	Impact Significance Prior to Mitigation Measures	Residual Impact Significance	Mitigation Measures
Turtle Entrainment in Suction Equipment			<ul style="list-style-type: none"> Offshore Traffic Plan shall be developed; Disclose and implement the Grievance Mechanism for the Project, and investigate any raised grievances in time; and All accidents, damage and near misses are reported.
	Moderate	Minor	<ul style="list-style-type: none"> If there are active (jetting) systems on the draghead, they will be switched on before engaging the dredge pumps. When the dredging operation stops, the dredging pumps will be switched off before switching off the jetting system. Details should be provided by the contractor in the dredge management plan. Slow starts to all equipment such as dredge heads and vessel movements to enable marine fauna in the vicinity to move away from the zone of influence or interaction. Any incidents that occur during dredging that result in the death of turtles will be documented and reported to the authorities when required. If vessel-turtle interactions due to entrainment are occurring at unacceptable levels, the dredge management plan will be reviewed and new risk mitigation measures implemented, where practicable.
Hazardous Materials, Fire and Explosion Risks	Minor	Negligible	<ul style="list-style-type: none"> Provide workers with helmets and other personal protection equipment such as eye protection, work gloves and protective boots. Ensure all staff wear appropriate personal protection equipment; Contact with local emergency services to inform them about the works and the mitigation measures in place; Carry out emergency drills with local emergency services.

Explanation of the dredging impacts on coastal erosion

- Characterization of coastline:
 - Revetment in northern part of Cavite City (1)
 - Houses directly at the coastline (2)
 - Narrow beaches south of Cavite (3)
 - Alternating and various coastlines along the city of Rosario, like revetments, beaches and houses (4)
 - Coastline Rosario - Naic consists mainly of beaches with numerous groynes (5)



- Simulations to assess potential erosion impacts on the coastline have been conducted with a wave model. The model compares the situation before dredging and after dredging. An example of a modelled scenario has been displayed below.



- The model concludes that the dredging will influence the wave height only limitedly, with a 2-3% increase/decrease. That is within the natural variability of the wave height. No changes to the coastline are expected to be caused by the project.
- As erosion is a concern of stakeholders, monitoring of the coastline will take place using satellite imagery. If any erosion impacts are identified due to sand winning activities (natural/anthropogenic phenomena shall be excluded), corrective actions will be proposed and implemented to mitigate such impact.

Explanation of the dredging impacts on fishing activities

- Impacts that have been assessed are reduction of fishing area, impact on the fish stock, impacts on the fish stock after dredging, and impacts on fish availability.
- Impact on the fishing area (Minor)

- Fishing by boat is still allowed as long as a safe distance is kept of 500 meters from the dredging vessels;
- Fishing nets should not be placed in area that is actively dredged; and
- No fishing structures (e.g. mussel farms, oyster farms, baklads) were identified in the borrow area;
- Impact on the fish stock (Minor)
 - Impact on the fish stock has been assessed by a local fisheries expert.
 - The most common fisheries resources were categorized into four broad groups, namely: pelagics, soft-bottom dwellers and feeders, hard bottom associated fishes, and oysters and mussels.
 - Short-term impacts assessed: sediment removal, sedimentation, turbidity, vessel movement and noise, and pollution. Long-term impacts assessed: effect of the dredging project on the sea bottom, specifically the deeper sea bottom.
 - Overall impact is Minor: non-lethal, and temporary disturbance. Fish are able to move away from dredging activities (pelagics), impacts on their refuge and foraging habitats will be limited. Only moderate impacts on fish movement and feeding behavior were assessed for the soft-bottom dwellers and feeders category.
- Impact on the fish stock after the dredging (Minor)
 - Most fish can move to adjacent areas and return to the affected areas after dredging.
 - The disturbed seabed would be available for recolonisation.
 - Deepening of the sea bottom is not expected to have an adverse impact on the target species.
- Impact on fish availability (Minor)
 - The dredging is unlikely to result in a marked loss of fish and fishery resources. However, the fish moving away from dredging operation may result in a localized change in fish abundance. In terms of fish availability, it is assessed that the affected area represents a “small” portion of the overall fishing grounds by local fishermen.
- Impact significance
 - Even though no significant impact is expected on fish stock or availability, the importance of fishing for municipal fisherfolk in coastal barangays makes that the overall impact has been assessed to be **moderate**. Therefore, livelihood restoration programs for municipal fisherfolk are recommended.

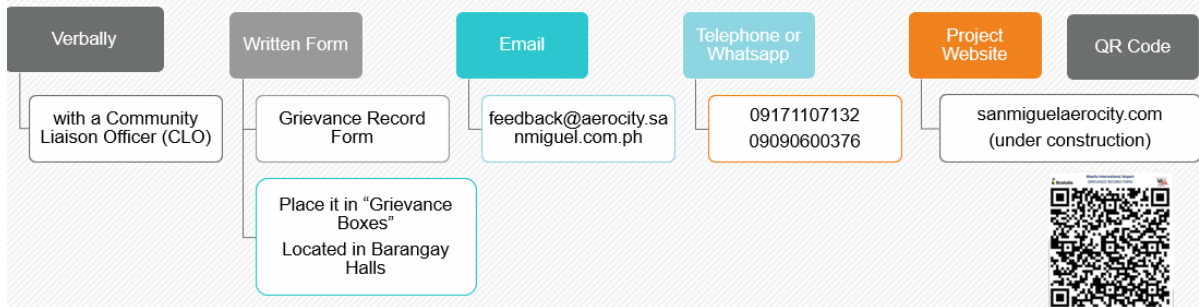
Livelihood Restoration

- Livelihood Restoration aims to mitigate adverse impacts on livelihoods of fishermen and women fishing in the municipal waters (boat owners, fishermen, net owners) where the dredging takes place. This does not include commercial fishing, as they typically fish outside of municipal waters.
- No stationary fishing structures (e.g. baklads, sapras, mussel farms) have been identified during the social baseline. If someone wants to establish a fishing structure in the project area they should contact the LGU to obtain relevant permits and to ensure coordination with the Project.
- The livelihood restoration programs will be developed and implemented in consultation with affected communities. Access to programs for women and vulnerable groups amongst the municipal fisheries will be facilitated.

- The proposed livelihood restoration programs will focus on sustainable development of local fishery by reducing the pressure on fish stock and enlarging the fish stock. Indicatively, the following programs will be considered:
 - Aquaculture and Fishery Capacity Building Program
 - Skills Training Program
 - Preferential Employment Program - potentially hiring fisher folk for community safety vessels and focal points of communication during dredging operations
 - Fisheries Improvement Program - Supporting fish stock reproduction
- Livelihood Restoration programs will fall under the umbrella the Social Development Management Plan.
- Livelihood monitoring will take place. Once it has been confirmed that the incomes of the municipal fisheries have been maintained, the program will be deemed complete.

Community Feedback and Grievance Mechanism

Any stakeholder can put in a Grievance (anonymously if preferred) through multiple channels:



- Once the claim is received and documented, the CLO screens and assesses the claim within **five (5) working days** from its reception or requests for additional information where needed
- Grievances are addressed (that means a decision should be communicated) within **30 days** from the reception of the claim.

Stakeholder Engagement on ESIA

- Engagement during ESIA:
 - Preliminary interviews
 - Fisherfolk surveys
 - Key informant interviews
- Engagement activities on ESIA:
 - Distribution of information leaflets on ESIA findings and posting of notices at Barangay-level to widely inform communities.
 - Disclosure of the Community Grievance Mechanism;
 - LGU and fisherfolk information meetings to disclose ESIA outcomes and respond to feedback.
 - Engagement on livelihood restoration measures;
 - Team of Community Liaison Officers available to receive and respond to feedback and concerns.
- Engagement activities will continue throughout dredging activities

