A TERMS OF REFERENCE

KERAJAAN NEGERI PULAU PINANG

THE PROPOSED RECLAMATION AND DREDGING WORKS FOR THE PENANG SOUTH RECLAMATION (PSR), PENANG

Environmental Impact Assessment (Second Schedule)

Terms of Reference (*Revision 01*)

April, 2016

SRS CONSORTIUM

Checklist of Terms of Reference

Contents	Description	Page
1. Project Proponent	Include contact details (complete address, phone and fax numbers) of the appropriate and responsible person(s) to whom enquiries regarding EIA should be directed.	1-3
2. List of Consultants/ Study Team	Details of each individuals (must be registered with DOE) who will carry out the EIA study, which include: i. DOE registration number; ii. Academic background; iii. Experience; iv. Area of study; and v. Declaration (signatures).	2-13 to 2-16
	The EIA consultant team is to be lead by a Team/Project leader/manager that is responsible for the EIA report. Include contact details (complete address, phone and fax numbers) of the appropriate and responsible person(s) to whom enquiries regarding EIA should be directed.	2-12
3. Statement of Need	The statement of need for a project should be clearly established early in the project planning. The basis and rationale for the proposal would reflect the objective of a project and provide direction during planning. A statement of need also highlights the various benefits of the proposed project.	3-1 to 3-9

Contents	Description	Page
4. Project Description/ Concept	The project concept must not contradict any development plans, policies or decisions of the Government of Malaysia.	2-3 to 2-10
	A description of the project must be given, including a description of the preferred project option including: i. Clear descriptions of the proposed: ■ Project concept.	4-6 to 4-7
	■ Project size.	4-9
	■ Project components.	4-9
	■ Process technologies (methodology).	4-9 to 4-12
	■ Development phases including future phase.	4-15 to 4-17
	ii. Clear, coloured and readable maps, diagrams and photographs.	All maps, diagrams and photographs are clear, coloured and readable.
	iii. The location maps should include: ■ General location.	4-1
	■ Specific location.	4-2
	■ Project boundaries.	4-2
	■ Project site/layout plan.	4-8
	iv. A clear and readable flow chart of the process production and explanation on the process including criteria involved and the maximum capacity, for industrial-based projects.	Not applicable
5. Project Options	A brief discussion on the project options of how the reasonable options were selected and provide the basis for the elimination or options determined to be not reasonable.	5-1 to 5-10
6. Description of Existing Environment	The description of the existing environment should identify as appropriate: i. The conditions of the physico-chemical, biological and human environment prior to the implementation of the project.	6-1 to 6-29
	ii. The spatial boundaries within which the environment has been considered.	6-2
	iii. Environmental sensitive areas of special or unique scientific, socio-economic or cultural value that may be affected by the proposed project. The area to be studied (zone of impact) will invariably need to extend beyond the immediate project boundaries as ecological effects can be fairly widespread.	6-29 to 6-30
7. Baseline Information on the Proposed Location	Outline the sampling methodologies, sampling locations, monitoring stations and sampling parameters in the collection of baseline information.	7-1 to 7-31

Contents	Description	Page
8. Project Location and Existing Land Use	i. The location of the project must be in accordance to the Guidelines on Siting and Zoning for Industries published by DOE; development plans such as the National Physical Plan, Structural Plan and Local Plan; and other relevant guidelines or requirements from other agencies.	2-2 to 2-10
	ii. Description of the project location shall include: ■ Exact location of proposed project with clear coordinates.	4-2
	■ Existing land use and constraints .	6-25 to 6-26
	■ Distance of the proposed project site to any environmentally sensitive receptors and areas.	6-29
	■ Macro scale maps (1:50,000 & 1:25,000), plans, photographs or satellite images, clearly identifying the location of the proposed project location.	4-2
	■ The land use map must be clear, readable and in coloured form. An updated satellite image to indicate the recent existing environment may be used. The coverage of the land use map must be at least within 5 km radius (interval of 250 m). For large scale project such as the construction of dams or impounding reservoirs, the coverage of the land use map may be beyond 5 km radius depending on the catchment area.	6-26
	iii. Other type of map to be produced in the TOR to describe the existing environment depends on the key and critical issues of the proposed project. They are: ■ Topography map.	4-5
	■ Bathymetry map	4-4
	■ Hydrological map	6-21
	■ Geological map	6-23
9. Potential Significant Impacts	Based on the critical issues of the proposed project, briefly describe the potential significant impacts to be studied and criteria that may be used for impact analysis.	8-1 to 8-3
	Outline of the methodologies on the impact analysis/assessment.	8-4
10. Mitigation and Abatement Measures	Based on the prediction of impacts to be studied, define the areas of the proposed project activities to be focused when discussing mitigation and abatement measures at these stages: i. Pre-construction (including feasibility studies and design); ii. Construction; and iii. Post-construction (including operation and maintenance).	8-4 to 8-6

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Attachments

Attachment 1	Responses to Comments during TOR Panel Review Meeting on 6th April 2016
Attachment 2	PAT Approval from DOE Penang (Ref.:AS(B)P50/013/100/014 Jilid1 (6)) dated 28th January 2016

01 Introduction

1.1 Introduction

The proposed project is entitled "**Environmental Impact Assessment (Second Schedule) for the Proposed Reclamation and Dredging Works for the Penang South Reclamation (PSR), Penang**". For brevity, it shall be referred to here as "**the Project**". This revised TOR is based on the response to the comments made during the TOR Panel Review meeting on the 6th of April 2016 *(Attachment 1)*.

1.2 Project Background

Penang has long faced challenges of traffic congestion, lack of comprehensive public transport system and infrastructure development not keeping up with Penang's rapid growth. A Penang Transport Master Plan (PTMP) by the Penang State Government is the answer to the traffic problems. The reclaimed land will be fully owned by the State Government and will be auctioned to finance the PTMP components, making it a fully self -funded plan. Rising property prices and shortage of quality affordable housing problems is foreseen to be solved by having a mixed development on top of the reclaimed islands; which is a plus in solving Penang's liveability concerns due to its high-speed and ad-hoc developments thus aiding the sustainability of Penang Economic Growth.

SRS Consortium Sdn. Bhd. will be the Penang state government's '*Project Delivery Partner'* (PDP) in ensuring smooth implementation of the entire project delivery process.

The inspiration of the reclamation comes from the intention in keeping Penang's growth engines humming at the south of the Penang Island. The Bayan Lepas Industrial Zone will be expanded since the existing zone is fully occupied with no room to grow. 30% of the companies want to expand their businesses along with new investors with high value added electrical and electronics industries wanting to enter.

The reclamation will take the development pressure off the main city of Georgetown. High quality living and amenities are now high in demand in order to attract and retain skilled workforce. A "Smart City" consisting of affordable housing, state administrative centre and residential & commercial area will be developed on top of the reclaimed cluster of islands to cater for this need.

The land reclamation of three islands will be at the coastline of southern Penang Island stretching from Gertak Sanggul, Teluk Kumbar and Tanjung Teluk Tempoyak (*Figure 1.1*).

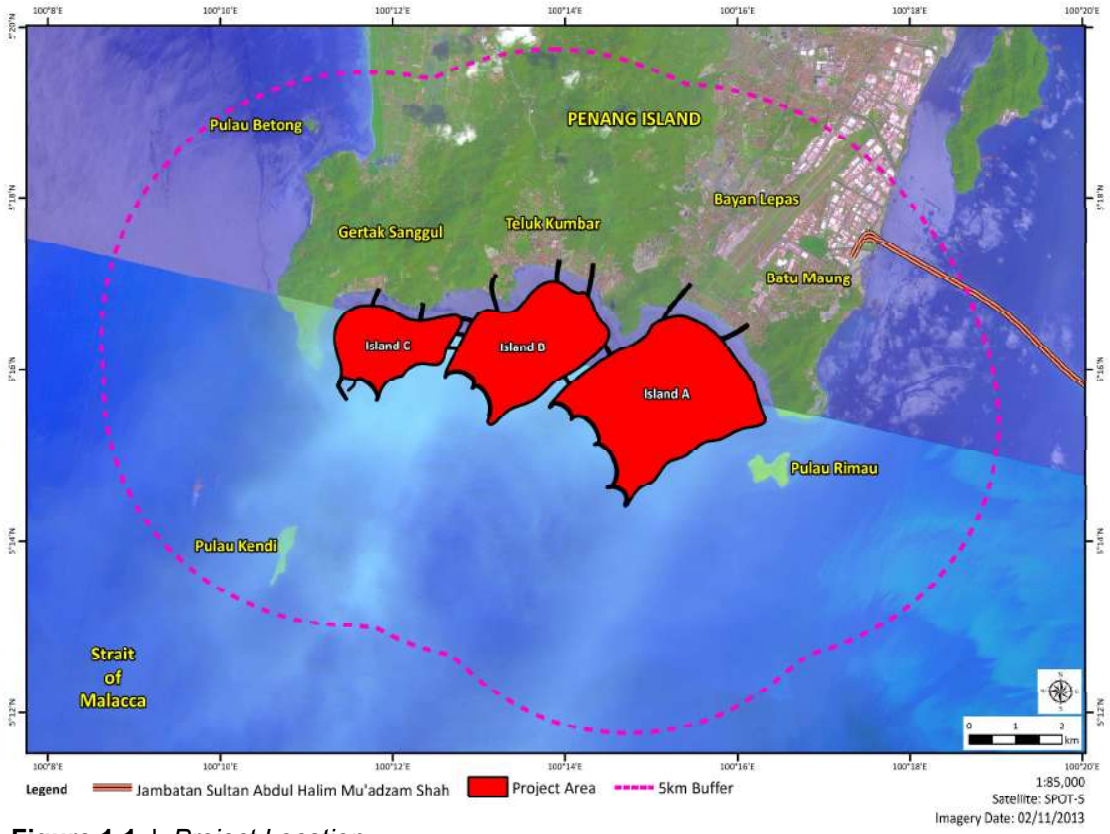


Figure 1.1 I *Project Location*

1.3 Project Proponent

The address and contact numbers of the Project Proponent are as follows:

Kerajaan Negeri Pulau Pinang
Kompleks Pentadbiran Kerajaan Pulau Pinang,
Paras 25, Komtar,
Georgetown, 10503 Pulau Pinang,
Malaysia.

Contact Person	:	Dato' Seri Farizan bin Darus
Telephone	:	+604-2615617
Facsimile	:	+604-2618618
Email	:	farizandarus@penang.gov.my

1.4 Project Delivery Partner (PDP)

SRS Consortium Sdn. Bhd.
73-3A-1, Ideal @ The One, Jalan Mahsuri,
11950 Bayan Lepas, Pulau Pinang,
Malaysia.

Contact Person	:	Andy Lee Choon Foh
Telephone	:	+604-6416888
Facsimile	:	+604-6411776
Email	:	AndyCFLee@gamuda.com.my

02 EIA Study & Team Members

2.1 Purpose

2.1.1 Terms of Reference (TOR)

One of the approval conditions of the preliminary site assessment (PAT) set by the Penang Department of Environment (DOE) (refer to *Attachment 2*) has specified that the Project Proponent is to submit a TOR for the EIA study to the Director-General of the DOE prior to the Project's implementation.

The purpose of this TOR is to identify the key issues of concern and to outline the environmental data collections that are required, determine the assessment techniques to be implemented, and identify the appropriate methodologies for impact prediction and assessment that need to be addressed in the EIA.

However, it is important to note that this TOR shall not cover the EIA study for the followings:

i) The sand sourcing activity;
ii) The disposal of dredged material;
iii) Topside development on the reclaimed land; and
iv) Any infrastructure works on the reclaimed land.

2.1.2 Environmental Impact Assessment (EIA)

The main purpose of the EIA study is to identify and assess the environmental impacts associated with the proposed Project in order to determine its feasibility in terms of the environment. A fundamental aim of the EIA will be to avoid or mitigate environmental impacts through pragmatic and workable solutions that are acceptable to both the Project Proponent and to the Department of Environment (DOE) rather than through indicative or theoretical measures. The findings of this study will contribute to the decisions on:

i) The development of the Project plan;
ii) The overall acceptability of the Project given any adverse environmental consequences that may arise; and
iii) The changes in environmental quality, both positive and negative, that will result from the Project's implementation.

2.1.3 Legal Requirements

2.1.3.1 Environmental Quality Act 1974 (Amendment 2012)

As stipulated under the Environmental Quality Act 1974 (Amendment 2012) and the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015, any activity which may have significant environmental impact is categorised as "Prescribed Activity" with an Environmental Impact Assessment (EIA) as the prerequisite component for an approval. Section 34A of the Environmental Quality Act 1974 (Amendment 2012) requires any project proponent with projects falling under the prescribed activity category to submit a report to the Director General of the Department of Environment (DOE). This report should contain, inter alia,

"*an assessment of the impact of such activity will have or is likely to have on the environment and the proposed measures that shall be undertaken to prevent, reduce or control the adverse impacts on the environment.*"

The prescribed activity of the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015 pertaining to the proposed development is as summarized in *Table 2.1*. The proposed project consists of multi-prescribed activities, but this EIA study shall only address the impacts from land reclamation and dredging.

Table 2.1 | *Multi-prescribed Activity of the Proposed Project*

Prescribed Activity	Term	Details
Land Reclamation (Second Schedule)	**Item 7**	**ii) Reclamation for man-made island.**
Dredging (First Schedule)	Item 15	i) Capital dredging.
Industrial Estate Development (First Schedule)	Item 17	Development of industrial estate covering an area of 20 hectares or more.
Housing (First Schedule)	Item 16	Housing development covering an area of 50 hectares or more.
New Township (First Schedule)	Item 18	Construction of new township consisting of 2,000 housing accommodation units or more or covering an area of 100 hectares or more.

From the Environmental Impact Assessment (EIA) Guidelines in Malaysia (2015) document; it has been stated in *Chapter 4:4.1 - Screening* that:

"*If the proposed project consists of more than one prescribed activity and one of them falls under the Second Schedule, then the project as a whole shall be considered to fall under the Second Schedule of the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order, 2015."*

Relevant legislations, statutory requirements and existing state and national development plans were also taken into consideration. These include the:

i) National Physical Plan 2;
ii) National Coastal Zone Physical Plan;
iii) Penang Structure Plan 2020; and
iv) Integrated Shoreline Management Plan (ISMP) Penang 2010.

2.1.3.2 National Physical Plan 2

The National Physical Plan 2 (NPP 2) sets out the national strategic spatial planning policies and measures in respect to the general direction and broad pattern of the land use and physical development and conservation in Peninsular Malaysia. The spatial planning vision, policies, measures and land allocations of the NPP 2 are translated primarily through the State Structure and Local Plan and eventually through the Action Area Plans and programmes.

The policies that are relevant to the proposed project are summarized in *Table 2.2*.

Table 2.2 | *Summary of Relevant Policies from the NPP2*

Policy	Measures	Remarks
NPP 5: Planning for industrial development shall adopt the holistic development strategy of the Third Industrial Master Plan (IMP3) of achieving global competitiveness via transformation and innovation of the manufacturing and services sector.	▪ The IMP3 Target Growth Areas for Manufacturing and Services will be promoted in areas where comparative advantages and agglomeration economies exist:- i) The main conurbations and urban areas shall provide an integrated network of infrastructure facilities including social amenities that support the capacity of industrial and service-related firms to compete in the global market place. ii) The location of target growth areas shall be encouraged in selected conurbations, depending on their respective comparative advantages. ▪ Special Economic Zones (SEZ) will be developed in selected locations to promote regional development and enhance the export potential of the country.	The type of industry on the reclaimed islands will be of E&E and shall have infrastructure facilities. The designated location is near to the existing Bayan Lepas FIZ to assist its expansion. Hence, the proposed PSR project is in line with the policy.
NPP19: Sufficient affordable housing with adequate community facilities, including security facilities and services, shall be provided in major urban centres to meet the requirements of the population.	▪ Adequate housing equipped with infrastructure, public facilities and amenities shall be provided based on affordability. ▪ Public common user's space shall be provided for social interaction and sustainable communities.	Affordable housing area will be provided with sufficient public facilities and amenities with proper educational and medical hub situated nearby. Open spaces, public beaches, coastal parks, waterfront and a cycling park are provided in support of sustainable communities.

Table 2.2 (cont'd) I *Summary of Relevant Policies from the NPP2*

Policy	Measures	Remarks
NPP24: Sensitive coastal and marine ecosystems shall be protected and managed in a sustainable manner. *IP17: Sensitive coastal ecosystems*	▪ Coastal reclamation shall not be encouraged except for the development of ports of strategic national importance. Coastal reclamation shall not be permitted in or adjacent to sensitive ecosystems such as marine parks, mangroves, mudflats, coral reefs, seagrass beds, turtle landing sites and major tourism beaches. All proposals involving coastal reclamation shall be referred to the National Physical Planning Council. ▪ Coastal planning and development shall take into account the strategies and measures contained in the *Rancangan Fizikal Zon Persisiran Pantai Negara* and the various Integrated Shoreline Management Plans (ISMP). ▪ Ecosystem-Based Fisheries Management (EBFM) shall be used as a management tool to ensure the sustainable management of marine fisheries. Specific conservation actions on the basis of EBFM shall include the development of recovery and management plans for all major fisheries, as well as the gazettement of additional Fisheries Prohibited Areas and important fishery habitats.	All measures outlined in the National Coastal Zone Physical Plan (RFZPPN) will be adhered to.

It is important to note that the proposed project is currently undergoing the process of the Council of the National Physical Planner approval.

2.1.3.3 National Coastal Zone Physical Plan (RFZPPN)

Through the NPP, the implementation of the NPP 24 policy is further detailed in the National Coastal Zone Physical Plan (RFZPPN) whereby this policy focuses on the coastal zone reclamation as shown in *Table 2.3*.

Table 2.3 I *National Coastal Zone Physical Plan (RFZPPN)*

Policy	Measures	Remarks
RFZPPN 6: Reclamation in the coastal zone is only permitted should its economic benefits be higher than its social and environmental costs.	All proposed coastal reclamation must be referred to the Council of the National Physical Planner.	The proposed reclamation is currently being referred to the Council of the National Physical Planner.
	Coastal reclamation shall not be encouraged except for the development of ports of strategic national importance.	The proposed reclamation is currently being referred to the Council of the National Physical Planner.
	Coastal reclamation shall only be considered with the following conditions:	
	i. It is important to control erosion or for the purpose of beach nourishment.	Erosion will be controlled and shall be assessed via the hydraulic study. Beach nourishment is proposed as part of the components of the reclamation.
	ii. It shall not affect the natural processes of the coastal hydrology regime.	Impacts on the natural processes of coastal hydrology regime shall be assessed via the hydraulic study.
	iii. It shall not affect the stability of the adjacent project site including the coastal zone.	Impacts on the stability of the adjacent project site shall be assessed via the hydraulic study.
	iv. It shall not affect the natural habitat especially the ESA Ranks 1 and 2.	Impacts on the natural habitat within the project area shall be assessed via the hydraulic study.
	v. The economic and social benefits of the coastal reclamation are much higher than its environment and social costs.	Both the economic and social benefit of the proposed PSR development shall be assessed in the EIA study.
	vi. All coastal reclamation works with an area of more than 50 hectares should obtain an EIA approval.	This TOR is a pre-requisite for the EIA study which shall be submitted to DOE for approval.

2.1.3.4 Penang Structure Plan 2020 (RSNPP)

The Penang Structure Plan 2020 (RSNPP) was prepared in accordance with the requirements and provisions of Part III of Town and Country Planning Act 1976 (Act 172). The preparation of RSNPP was to compliment the system of physical planning in addition to translate policies of the National Physical Plan (NPP). It is also to harmonize the policies of existing and the future development plan of the state. The RSNPP is depicted in *Figure 2.1* while *Figure 2.2* shows the proposed project location partially gazetted in the RSNPP.

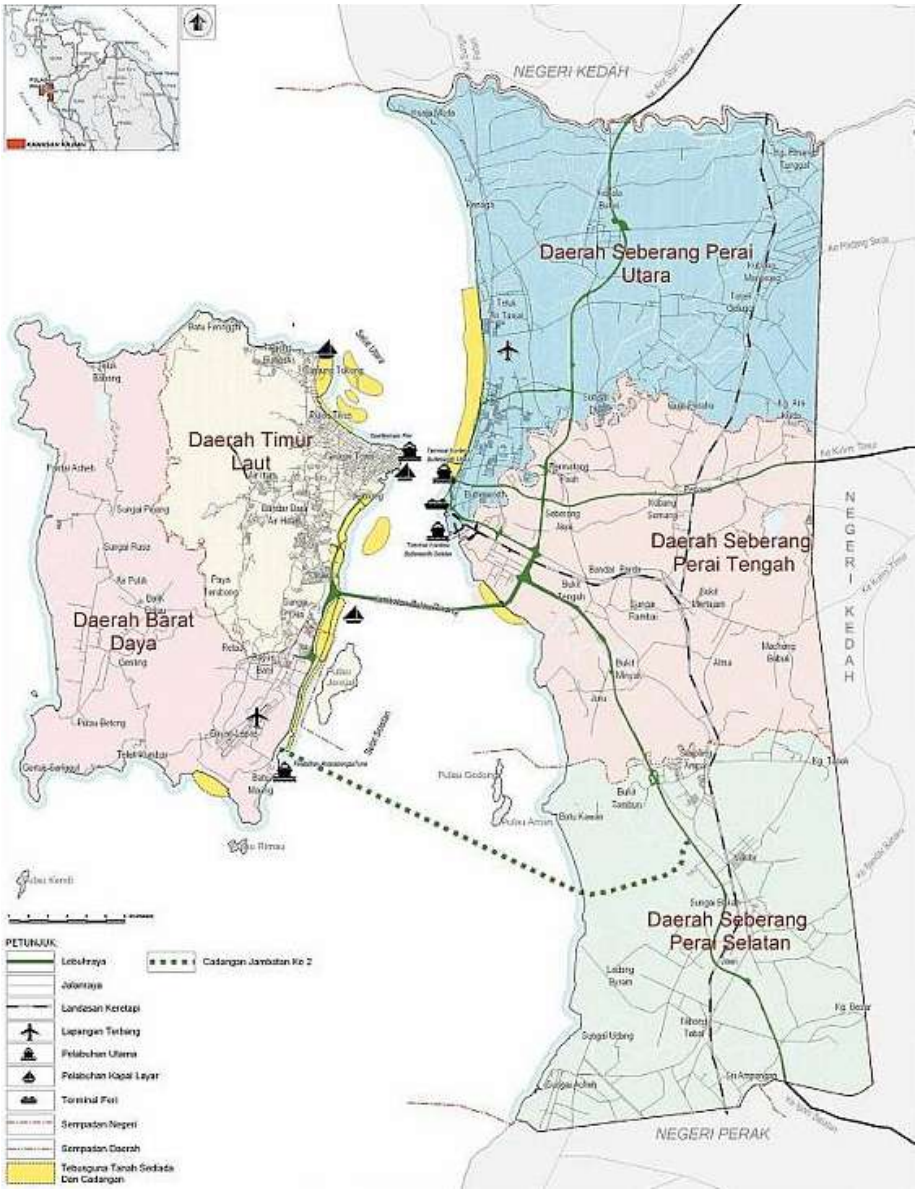


Figure 2.1 | *Study Area of Penang Structure Plan 2020*

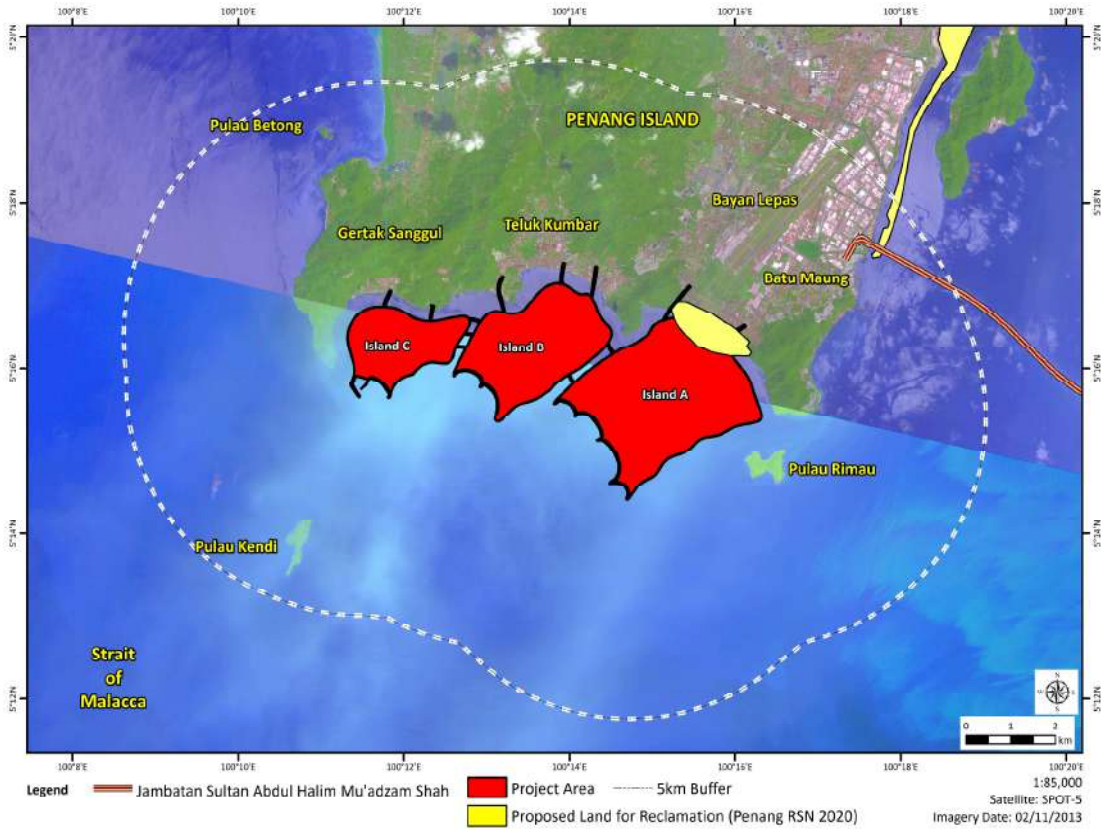


Figure 2.2 I *The Project Area Reclamation Partially Gazetted on the Penang Structure Plan 2020*

At the time of this writing, the Project Proponent is working closely with the JPBD Penang to incorporate the proposed project in the RSNPP.

2.1.3.5 Integrated Shoreline Management Plan (ISMP) Penang 2010

The project area covers the southern coastline of Penang Island where the ISMP Penang has compartmentalized it into Management Units (MU). The MUs related to the proposed project are shown in *Figure 2.3*. The summary of the MU pertaining to the proposed project is tabulated in *Table 2.4*.

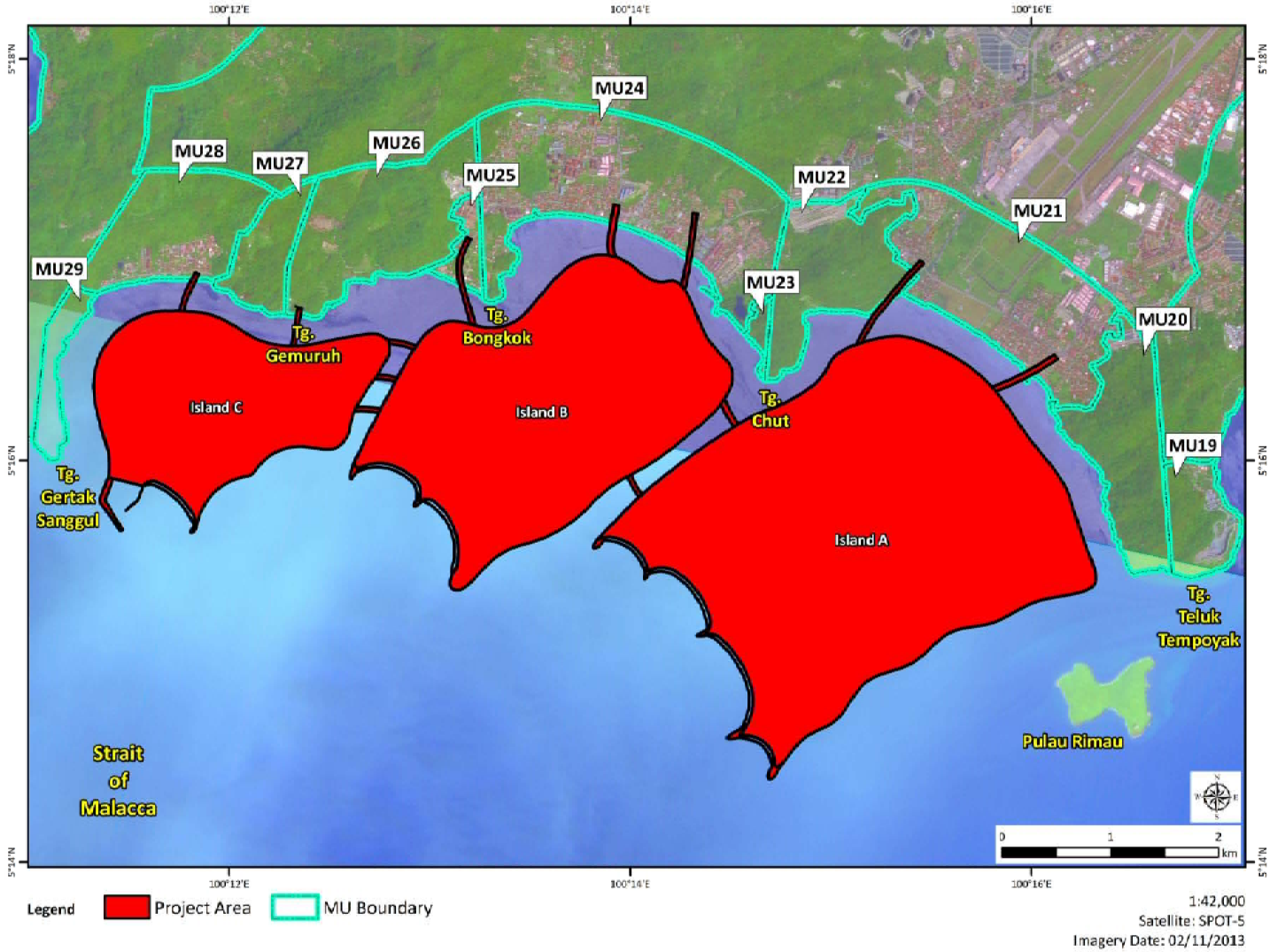


Figure 2.3 I *The MUs related to the Proposed Project*

Table 2.4 I *Summary of the MU*

MU	Proposed Coastal Development Plan	Project
19 & 20 (Teluk Tempoyak Besar - Teluk Ikan Mati)	There is presently no known major proposed development in this MU. However, under management objectives and strategies, these MUs allow for airport extension.	The proposed PSR will provide artificial land to provide an area for airport extension. Therefore, this is in line with the ISMP.
21 & 22 (Sungai Ikan Mati - Sungai Bayan Lepas)	The Penang Structure Plan has designated this area for reclamation for the expansion of the Bayan Lepas International Airport. Additional land may also be reclaimed to create more industrial area under the Penang Cyber City (PCCI) development.	The proposed PSR project includes a 'Smart City' consisting of industrial, commercial and residential area. This is in line with the ISMP.
23 & 24 (Tanjung Chut - Teluk Pak Pajuh)	Under the Penang Structure Plan, this MU has been designated as part of the Southern Beach Tourism Zone comprising of Gertak Sanggul, Bayan Lepas and Teluk Kumbar areas.	The proposed PSR project plans to enhance the existing coastline features by upgrading the fishermen's jetties and conducting beach nourishment to further increase the marketability of the area not only in fisheries, but also tourism. Thus, the PSR project is in line with the ISMP.
25 & 26 (Tanjung Bongkok - Tanjung Gemuruh)		
27 & 29 (Tanjung Gemuruh - Tanjung Gertak Sanggul)		

2.2 EIA Study Approach

The proposed study will involve the collection and analyses of primary and secondary data related to the Project site and its surroundings. The scope of work of this EIA study will follow the requirements of the following:

2.2.1 Policies

i) National Physical Plan-2. Federal Department of Town and Country Planning. 2010;
ii) Rancangan Fizikal Zon Pesisiran Pantai Negara (RFZPPN). Federal Department of Town and Country Planning. 2012;
iii) Rancangan Struktur Negeri Pulau Pinang 2020;
iv) Rancangan Tempatan Majlis Bandaraya Pulau Pinang;
v) Northern Corridor Economic Region (NCER) Socioeconomic Blueprint 2007 – 2025. 2007;
vi) Integrated Shoreline Management Plan (ISMP) Pulau Pinang. 2010;
vii) National Policy on Climate Change 2010; and
viii) National Biodiversity Policy 1998.

2.2.2 Legislations

i) Environmental Quality Act 1974 (Amendment 2012);
ii) Exclusive Economic Zone Act 1984;
iii) Continental Shelf Act 1966;
iv) Fisheries Act 1985;
v) Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015;
vi) Environmental Quality (Scheduled Wastes) Regulations. 2005;
vii) Solid Waste and Public Cleaning Management Act 2007;
viii) Environmental Quality (Sewage) Regulation 2009;
ix) Environmental Quality (Clean Air) Regulation;
x) Lembaga Kemajuan Ikan Malaysia Act 1971 (Act 49);
xi) Port Authorities Act (1963) (Revised 1992); and
xii) Merchant Shipping (Oil Pollution) Act 1994.

2.2.3 Guidelines

i) A Handbook of EIA Guidelines. Department of Environment Malaysia. 1987 (3rd Edition, 2008);
ii) Environmental Impact Assessment (EIA) Guidelines in Malaysia (2015);
iii) Environmental Impact Assessment (EIA) Guidance Document for Coastal and Land Reclamation;
iv) Guidelines on Erosion Control for Development Projects in the Coastal Zones 1/97;
v) Guidelines of Preparation of Coastal Engineering Hydraulic Study and Impact Evaluation (for Hydraulic Studies using Numerical Models) (Fifth Edition). 2001;

vi) Environmental Impact Assessment (EIA) Guidance Document for Sand Mining/Dredging Activities;
vii) Guidelines for Prevention and Control of Soil Erosion and Siltation in Malaysia;
viii) The Planning Guidelines for Environmental Noise Limits and Control;
ix) Buku Panduan Kawasan Sensitif Alam Sekitar. Department of Environment Malaysia. 1993; and
x) Long-term Sea Level Change in the Malaysian Seas from Multi-mission Altimetry Data. Din *et al.,* 2012;
xi) Guidelines on the Economic Valuation of the Environmental Impacts for EIA Projects. Department of Environment. 2010; and
xii) Malaysia Civil Aviation Regulations 1996. (Amendment 2004).

2.2.4 International Law and Guidelines

i) United Nations Convention on the Law of the Sea (UNCLOS). 1982;
ii) The World Conservation Union (IUCN) Red List of Threatened Species. 2007;
iii) Indicators of Sustainable Development: Guidelines and Methodologies, Third Edition. 2007; and
iv) Convention on International Trade in Endangered Species of Wild Fauna and Flora 1973 (CITES 1973).

2.3 EIA Study Team Members

The EIA and Hydraulic studies shall be carried out by Dr. Nik & Associates Sdn. Bhd. The addresses and contact information of the consultants are as follows:

Dr. Nik & Associates Sdn. Bhd.
No. 22 & 24, Jalan Wangsa Delima 6,
Kuala Lumpur Suburban Centre (KLSC),
Section 5, Pusat Bandar Wangsa Maju,
53300 Kuala Lumpur.

Contact Person	:	Puan Rosniza Ramli, *Study Team Leader* (Head of Environmental Department) Ir. Iwan Tan Sofian Tan (Head of Coastal Department)
Telephone	:	+603 - 4145 8888
Facsimile	:	+603 - 4145 8877

The EIA study will be carried out by the relevant Consultants as listed in *Table 2.5* and assisted by Assistant Consultants as per *Table 2.6.*

Table 2.5 | *List of EIA Study Consultants*

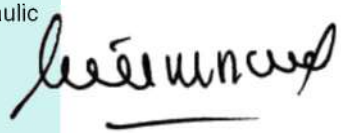
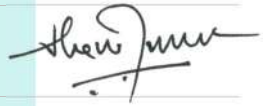
Name	Qualification	Registration with DOE				Area(s) of Study	Signature
		Category	Area/Field	ID No.	Valid Date		
A. EIA Study Team Leader:							
1. Rosniza Ramli	B.Sc. (Marine Science)	EIA Consultant	■ Ecological Studies ■ Water Quality ■ Benthology ■ General Environmental Management	C0164	31st March 2019	■ Water Quality ■ Sediment Quality ■ Impact Assessment and Environmental Management	
B. EIA Study Team Member:							
2. Dato' Ir. Dr. Nik Mohd. Kamel Nik Hassan	O.N.D. (Civil Eng), B.Sc. (Civil Eng.), M.Sc. (Civil Eng.), PhD. (Hydraulics Eng.)	EIA Consultant & Subject Specialist	■ Dredging and Reclamation Impact Assessment ■ Coastal and Maritime Engineering ■ Water Resources and Flood Mitigation	CS0437	31st March 2019 / 31st March 2021	■ Coastal Hydraulic ■ Dredging and Reclamation Impact Assessment	
3. Ir. Iwan Tan Sofian Tan	B.Eng. (Civil)	EIA Consultant	■ Coastal Engineering ■ Hydraulics Numerical Modelling ■ Coastal Geomorphology ■ General Environmental Management	C0150	31st March 2019	Coastal Engineering	
4. Ir. Mohd. Taha Abd. Wahab	B. Sc. (Civil), M. Eng. (Sc)	Subject Consultant	Geotechnical Studies	SS0902	30th June 2016	Geotechnical	
5. Ir. Dr. Wong Wai Sam	B.Eng. (Civil), M.Eng. Sc. (Hydrology & Hydraulics), PhD. (Hydrology, Hydraulic & Hydrogeology)	Subject Consultant	■ Hydrology ■ Water Resources Management ■ Erosion and Sediment Control Plan (ESCP)	SS0907 (CPESC Reg. No: 4154)	31st March 2021	Hydrology	

Table 2.5 (cont'd) | *List of EIA Study Consultants*

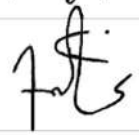
Name		Qualification	Registration with DOE				Area(s) of Study	Signature
			Category	Area/Field	ID No.	Valid Date		
B. DEIA Study Team Member:								
6.	Dr. Nor Ghani Md Nor	B.A. (Economics & Account), M.A. (Economics), PhD. (Economics)	Subject Consultant	■ Economic Valuation of Environmental Impacts ■ Environmental Cost Benefit Analysis	SS0252	14th May 2018	Environmental Economic Valuation	
7.	Dr. Norhayati Ahmad	B.Sc. (Biology), M.Sc. (Conservation Biology), PhD (Zoology)	Subject Consultant	Ecological Studies	SS0270	30th April 2020	Terrestrial Fauna	
8.	Dr. Maimon Abdullah	B.Sc. (Biology), M.Sc. (Biology), PhD. (Biology)	EIA Consultant	■ Ecology ■ Environmental Physiology	C0244	31st March 2019	Terrestrial Flora and Fauna	
9.	Dr. Wan Juliana Wan Ahmad	B.Sc. (Botany), PhD. (Plant & Soil Science)	Subject Consultant	■ Plant Diversity ■ Mangrove Forests Species ■ Wetland Ecosystem	SS0649	13th May 2018	Terrestrial Flora	
10.	Gopinath Nagaraj	B.Sc. (Aquatic Biology), M.Sc. (Aquaculture), Post Masters Certificate (Fish Hatchery Management)	EIA Consultant	■ Fisheries ■ Ecological Studies ■ Aquaculture	CS0474	1st October 2017	Marine Ecology 1	
11.	Puvanesuri a/p Sandera Sagaren	B.Sc. (Aquatic Biology), M.Sc. (Environment)	EIA Consultant	■ Fisheries ■ Ecological Studies ■ Aquaculture	CS0956	30th Nov 2018	Marine Ecology 2	

Table 2.5 (cont'd) I *List of EIA Study Consultants*

Name		Qualification	Registration with DOE				Area(s) of Study	Signature
			Category	Area/Field	ID No.	Valid Date		
B. DEIA Study Team Member:								
12.	Capt. Ismail Hashim	Malaysian Certificate of Education, Division 1, Ordinary National Certificate in Nautical Science, Master Mariner Class 1	Subject Specialist	Marine Traffic and Navigational Safety	SS1290	30th June 2020	Marine Traffic and Navigation	
13.	Ir. Dr. Zaki Zainudin	B.Sc. (Chemical Engineering), M.Sc. (Environmental Engineering), PhD. (Environmental Engineering)	Subject Consultant	■ Water Quality ■ Water Quality Modelling	SS0205	30th Nov 2020	Water Quality	
14.	Datin Dr. Asmah Ahmad	B.A (Hons.) Geography, M.Soc. Sc. (Geography), PhD. (Geography)	Subject Consultant	Social Impact Assessment	SS0516	9th April 2018	Socio-economy	

Table 2.6 | *List of EIA Study Assistant Consultants*

	Name	Qualification	Registration with DOE			Area of Study	Supervised by	Signature
			Category	Area/Field	ID No.			
1.	Muhammad Faiz Abdullah	B.Sc. (Environmental Sc.)	Assistant Consultant	▪ Air Quality ▪ Noise and Vibration ▪ General Environmental Management	AC0903	General Environmental Management	Rosniza Ramli	
2.	Muhammad Fauzan Pauzi	B.Eng (Civil)	Assistant Consultant	▪ Water Quality ▪ Wastewater ▪ Solid Waste Management	AC5011	Water Quality	Ir. Dr. Zaki Zainudin	
3.	Shareena Azliani A. Aziz	B. Eng (Civil), M.Eng (Water Engineering)	Assistant Consultant	▪ Water Quality ▪ Wastewater	AC5082	Water Quality	Ir. Dr. Zaki Zainudin	
4.	Putri Zulaikha	B. Eng (Civil)	Assistant Consultant	▪ Water Quality ▪ Wastewater ▪ Solid Waste Management	AC5080	Water Quality	Ir. Dr. Zaki Zainudin	
5.	Zahara Yaakop	B.Eng (Civil)	Assistant Consultant	▪ Erosion and Sedimentation ▪ Hydraulics & Coastal Engineering	AC1119	Sediment Transport	Ir. Iwan Tan Sofian Tan	

03 Statement of Need

3.1 Introduction

Penang is one of the Malaysia's most developed states. In particular, the island of Penang is the economic hub for the Northern Corridor and is a key tourism centre and manufacturing cluster for Malaysia. It also houses the State administrative centre and Penang's International Aiport. Penang Island is in need of new land for development to keep up with the rapid economic and population growth. It is the most populated island in Malaysia. Therefore, the proposed southern reclamation is to ensure that Penang would be able to move forward and flourish economically.

The topography of Penang Island is undulating; hence restricting the availability of suitable land to develop. The reclamation of three man-made islands as proposed will be a solution to this problem. Not only that, these islands will be used by the State Government to fund much needed infrastructure and public transport projects as part of the Penang Transport Masterplan (PTMP).

In summary, PSR aspires to bring about significant economic and social benefits to Penang State, and contribute towards alleviating Penang's transport problems.

3.2 Expansion of Bayan Lepas Industrial Zone

The Electrical & Electronics sector is a very important sector to Malaysia. The E&E sector contributed RM62 billion in GDP in 2014, accounts for 25% of total manufacturing output in Malaysia and attracted RM10 billion of Foreign Direct Investment into Malaysia in 2013 (representing 19% of all FDI investments into Malaysia).

The Bayan Lepas E&E cluster & ecosystem, which has been developed over 40 years, is the major reason for Malaysia's continued success in the E&E sector. In 2015, the Bayan Lepas region accounted for RM120 billion worth of E&E exports, representing 40% of Malaysia's total E&E exports. The World Bank and the United Nations Industrial Development Organisation has described Bayan Lepas as the "most successful export zone" and "most vibrant cluster" respectively.

There are more than 500 companies in the Bayan Lepas area. The multi-national companies and Malaysia companies have developed a unique ecosystem, working as a cluster and cannot be replicated elsewhere. Both MNCs and Malaysian companies are moving up the value chain and need land to expand.

The existing Bayan Lepas Free Industrial Zone (FIZ) is 100% fully occupied with no room to grow. There are about 588 existing companies with 471 small and medium sized enterprises (SME) and 117 multi-national corporations (MNC) in Bayan Lepas FIZ. Approximately, 75% of the SMEs belong to Malaysians. The companies are mostly of electrical and electronics (E&E) industry. This E&E cluster has been developed for over 40 years. There are many former MNC employees who established many of the present SMEs such as LKT Engineering, Globetronics, Shinca, Shintel and Nanometric (Unico). Many SMEs which have been nurtured by and have linkages to the MNCs strengthened over time. Some of the SMEs are now global contract manufacturers. For that reason, the combination of MNC and SME cluster present in Bayan Lepas are not easily replicated elsewhere.

It is therefore important to expand the Bayan Lepas FIZ to give room to these enterprises and corporations to spread their wings. Existing companies are planning to expand; on top of that, new investors with high value added E&E industries are coming in to invest. Island A of the reclaimed islands will include the extension of FIZ. An artist's impression of the proposed industrial zone is shown in *Figure 3.1*.

Figure 3.1 | *Artist's Impression of the Proposed Industrial Zone*

3.3 Economic and Employment Benefit

PSR will provide positive economic and social impact due to the additional economic activity that it generates. This will come from the reclamation works, infrastructure, property development and further along - higher value-add manufacturing and services activities.

Holistically, construction of the project (PSR and PTMP components) is expected to contribute at least 10% each year to Penang's 2013 Gross Domestic Product (GDP). The project's construction activities are estimated to deliver an output multiplier of 2.5 times to the economy and contribute significant impact to Penang's future growth. This will further elevate Penang's status as one of the most liveable cities in Asia and beyond and as an advanced metropolis with a robust manufacturing and services hub.

Plenty of new employment opportunities will be available once the PSR project starts. The commencement of the project will attract young job seekers to start new careers. This will subsequently improve their living. It would also be very convenient for the existing residents as they only have to travel a short distance to their work place. By year 2050, new investments into the proposed project components will create more than 300,000 job opportunities, particularly in the manufacturing and services sector.

3.4 Decentralized Development Away from Georgetown

Currently, in Penang Island, majority of developments are centralized in Georgetown. Rapid rise of economy calls for increased urban growth. The existing infrastructure development is not keeping up with the rapid urban growth. There might be a possibility that Georgetown would be unable to provide for this need. It is thus deemed necessary to open up a new centralized township that can cater for good quality living and amenities in order to attract and retain skilled workforce.

The man-made islands will have a mixed development consisting of residential, commercial, industrial and education/medical hub furnished with modern amenities to harmonize the future growth of Penang. A "Smart City" will be developed with ample open spaces, parks and key amenities (*Figure 3.2*). Some of the public amenities provided are 5 km long public beaches, 32 km long coastal park and waterfront; and a network of bicycle path. There will be approximately a total of 550 acres of green spaces which makes up 12% of the whole acreage. Green connections on the islands will comprise designated bicycle lanes and sheltered pedestrian walkways.

Figure 3.2 I *Open Space, Parks and Key Amenities on the Reclaimed Islands*

3.5 Provide New Area for Affordable Housing

The property prices in Penang are steadily rising too in combination with its rapid urban growth. The area is becoming more and more deprived of quality affordable housing, with pressure on livability due to the many ad hoc developments. The PSR project will not only expand the island's economy, but will also provide land which will be used for affordable housing.

3.6 Alleviating Traffic Congestion

The sale of land from the reclaimed islands at the south of Penang Island will help to fund infrastructure and public transportation components of the PTMP, which is aimed at catering for long term growth in demand up to 2065. The PTMP is expected to be the solution to Penang's traffic congestion.

Traffic congestion problems in Penang have been unresolved for quite some time. Penang lacks integrated transport planning and does not fully utilize various modes of transportation available such as rail and water. There is a lack of a comprehensive public transport system, and infrastructure development has not been keeping up with rapid urban growth.

The role of rail transport should be an integral part of Penang's transportation system. Therefore, the Penang State Government plans to develop an integrated transport masterplan which includes the development of an alternative spine highway, light rail transit (LRT), monorail, tram, bus rapid transit (BRT) and Keretapi Tanah Melayu (KTM) routes. The proposed reclaimed islands will include the Public Transport network which includes the LRT *(Figure 3.3),* tram *(Figure 3.4)* as well as buses.

The existing network in Penang is only 18.5 km long and only covers the Eastern Coastal Corridor with no by-pass routes which contributes to the traffic congestion. Comparing it to the well-developed Singapore, its network is 161 km long and covers most part of the country.

The alternative spine highway to be named Pan Island Links (PIL) will take the traffic load off from Lim Chong Eu (LCE) Expressway and directly links the Penang Second Bridge to Gurney Expressway. There are six (6) interchanges that will provide better dispersal and accessibility by segregating local and regional traffic. The proposed North-South Expressway (NSE) Link will also be developed to by-pass the already congested NSE in Seberang Perai. The road and circulation network on the reclaimed islands will be connected to the PILs as shown in *Figure 3.5*.

Figure 3.3 I *Proposed LRT Network on the Reclaimed Islands*

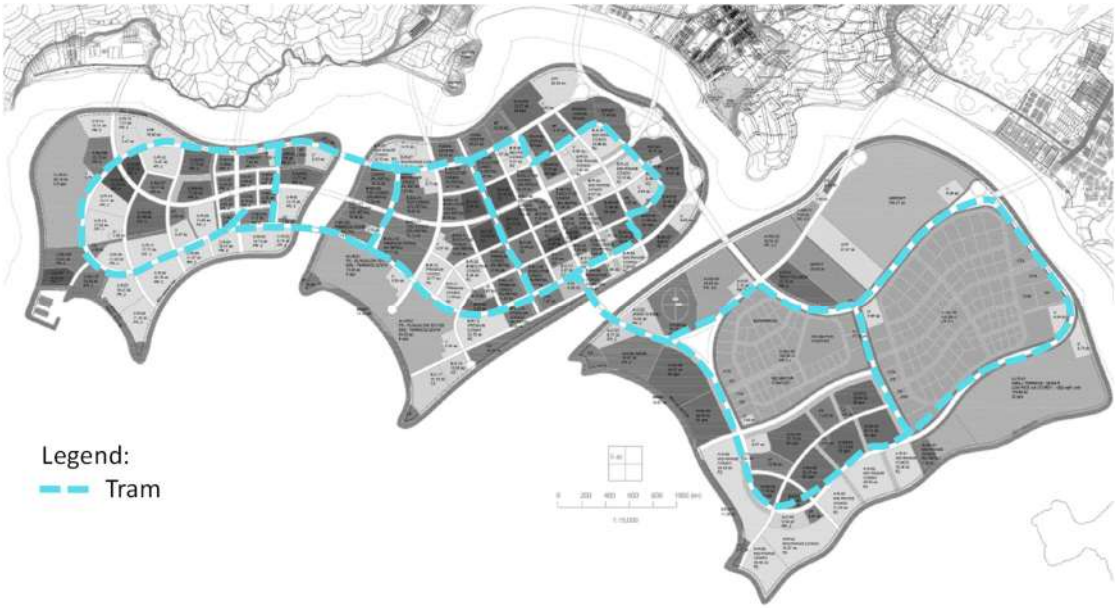


Figure 3.4 I *Proposed Tram Network on the Reclaimed Islands*

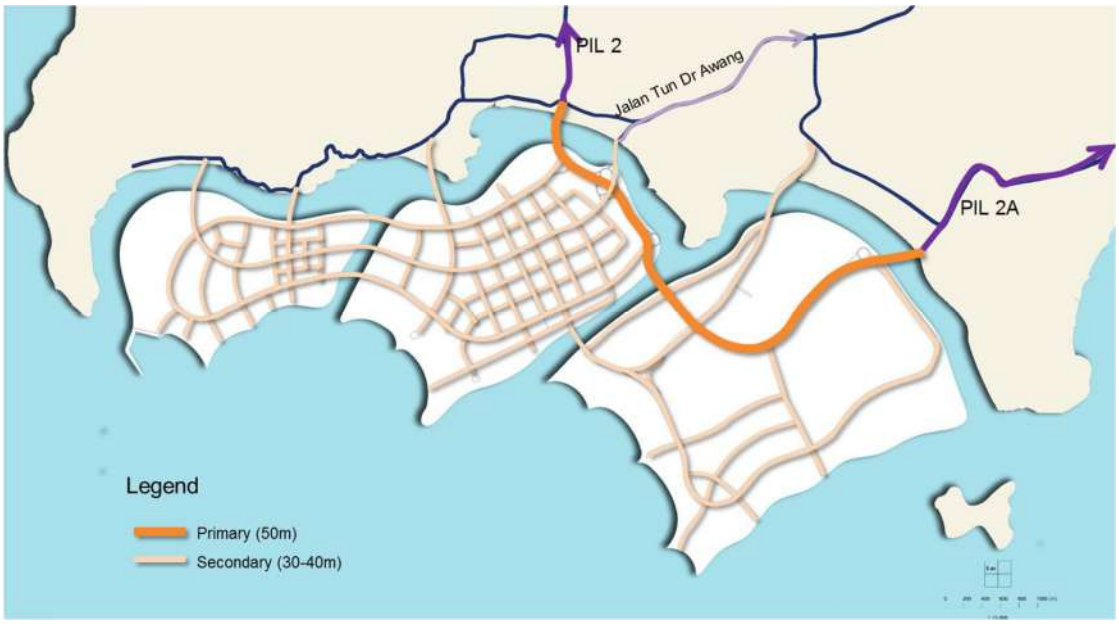


Figure 3.5 I *Proposed Road and Circulation Network on the Reclaimed Islands*

3.7 Benefits to the Fishermen

The southern coast is already very developed, with developments already encroaching towards the existing coastline. The existing development in Teluk Kumbar as shown in *Photo 3.1* shows that the area is already well developed. This is already putting pressure on the existing coastline and the communities that live by the coast.

Photo 3.1 I *Developments in Teluk Kumbar Area*

The reclaimed islands will adopt the "Island Concept", which includes maintaining the access to sea with wide channels and deep waterways. There will be no relocation of fishing villages around the area; instead the development of PSR will provide and improve further their existing facilities.

Some existing mudflats around the South Coast of Penang Island restrict access to sea. The reclamation will include some dredging of the seabed near the coastline *(Figure 3.6)*. Other enhancement measures such as improving amenities, etc. can be considered.

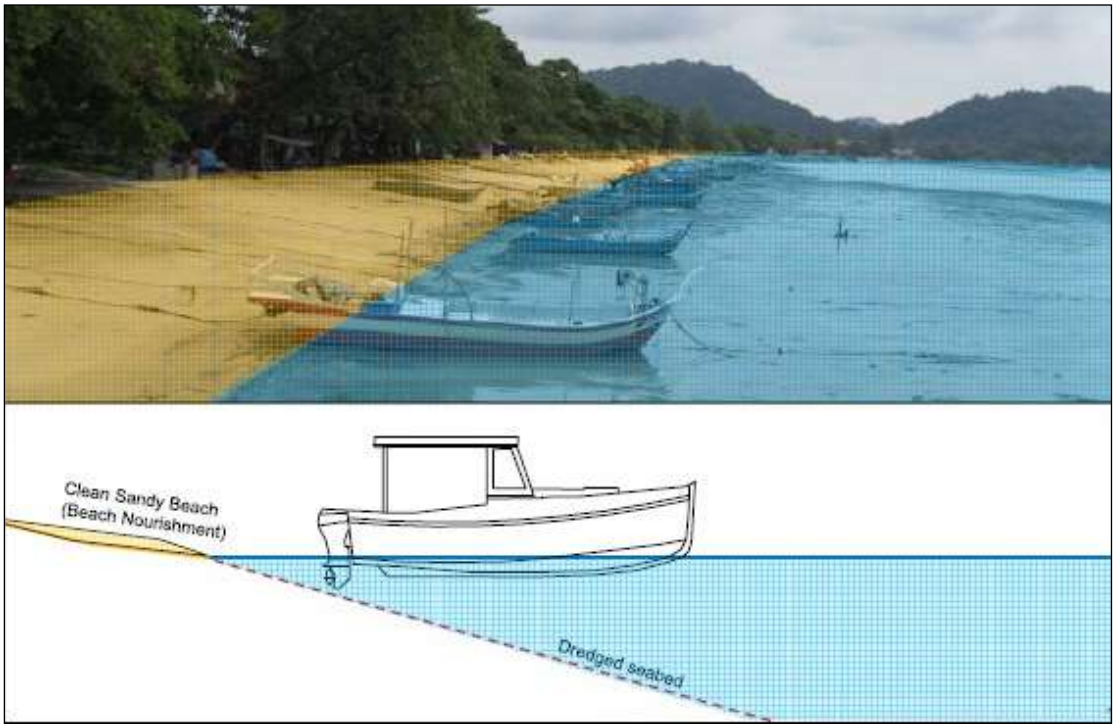


Figure 3.6 I *Proposed Dredging to Improve Access to Sea*

The development of the man-made islands can also expose the fishermen to other opportunities such as tourism, recreational fishing, aquaculture and seafood restaurants. Proposed water taxis *(Figure 3.7)* will accommodate these possible future demands as well as provide new job opportunities for the fishermen.

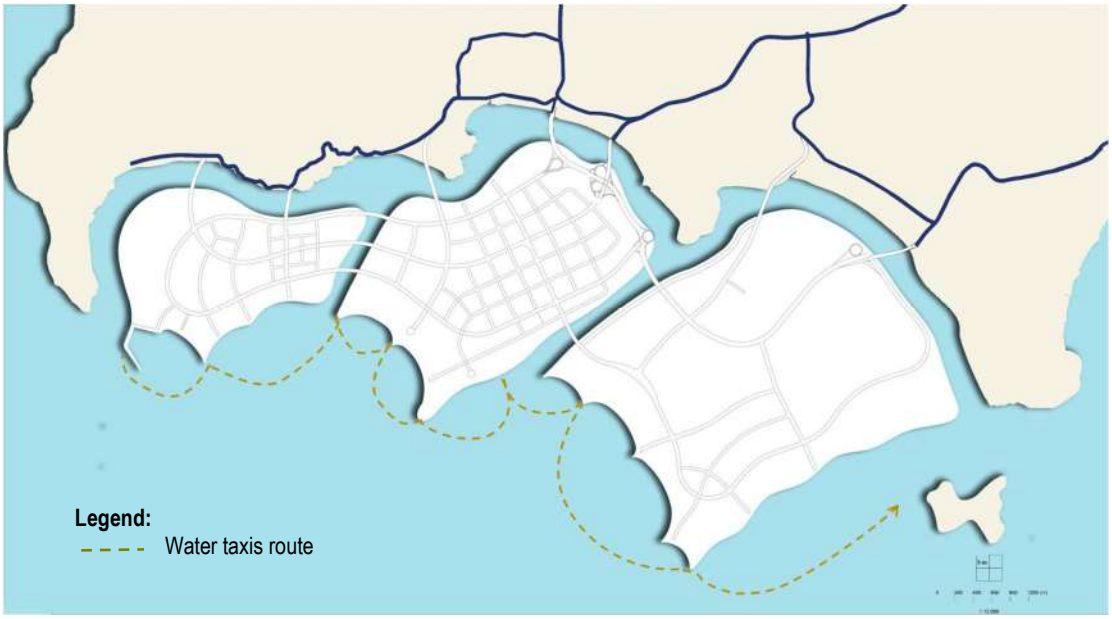


Figure 3.7 | *Proposed Water Taxis at the Reclaimed Islands*

05 Project Options

Several project options will be made to give a clear basis for choice among the options for the decision-maker and the relevant parties involved. They will briefly be described in this chapter. The project options are as the followings:

i) Location options;
ii) Layout options;
iii) No-Build options.

5.1 Location Options

5.1.1 Option 1: West Coast of Penang Island

The West Coast of Penang Island (*Figure 5.1*) has been identified to be rich with mangroves. There is also the Penang National Park located in the west which is the first protected area legally gazetted under Malaysia's National Park Act of 1980. The west coast of Penang was hit by the tsunami in 2004. Therefore, this area is deemed unsuitable to have the reclamation project due to its sensitivity.

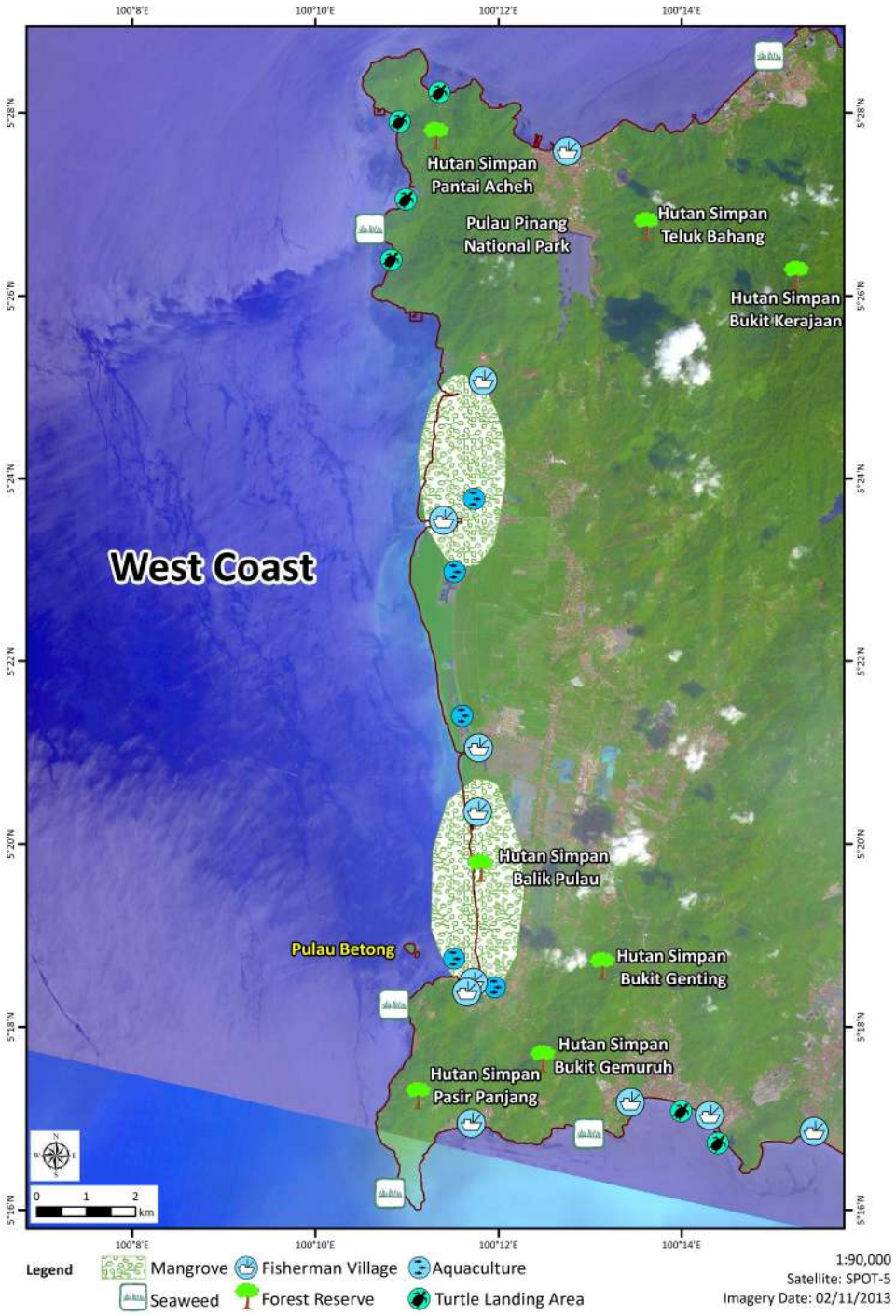


Figure 5.1 I *West Coast of Penang Island*
Sources: 1. RSNPP 2020; 2. Fisheries Department; 3. RFZPPN; 4.ISMP Pulau Pinang

5.1.2 Option 2: North Coast of Penang Island

The North Coast of Penang (*Figure 5.2*) has irregular coastline and exposed to the tsunami as recorded in 2004. It is also highly populated with tourists and lined with beachfront resorts. This area is also unsuitable for any reclamation project because it is already over-populated and sensitive to possible incoming tsunami waves.

Figure 5.2 | *North Coast of Penang Island*
Sources: 1. RSNPP 2020; 2. Fisheries Department; 3. RFZPPN; 4.ISMP Pulau Pinang

5.1.3 Option 3: East Coast of Penang Island

The East Coast of Penang Island (*Figure 5.3*) was also studied as a potential reclamation area. However, there are seagrass beds at Middle Bank with strong currents which may cause erosion and sedimentation issues. The seagrass beds are home to various marine lives and an important breeding ground for fish and other aquatic life. If the reclamation was conducted at the east coast, it would destroy not only the ecosystem but also the income source of about 10,000 fishermen registered with the Penang Inland

Fisherman's Welfare Association. Besides that, the bathymetry of the Middle Bank is high in between deep navigation channels which makes the reclamation cost higher as shown in *Figure 5.4*. Therefore, this area is definitely not fit to have the reclamation project.

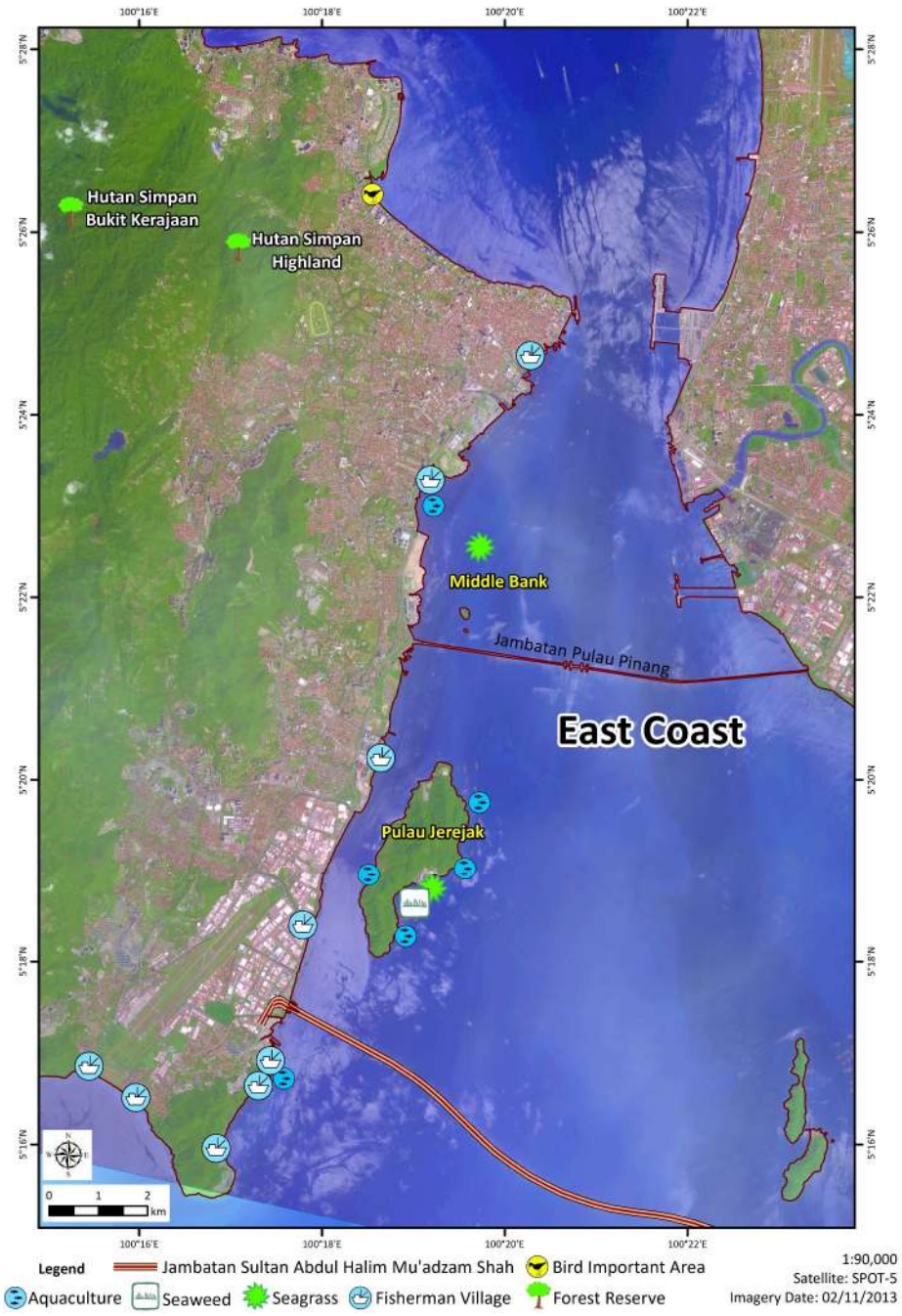


Figure 5.3 I *East Coast of Penang Island*
Sources: 1. RSNPP 2020; 2. Fisheries Department; 3. RFZPPN; 4.ISMP Pulau Pinang

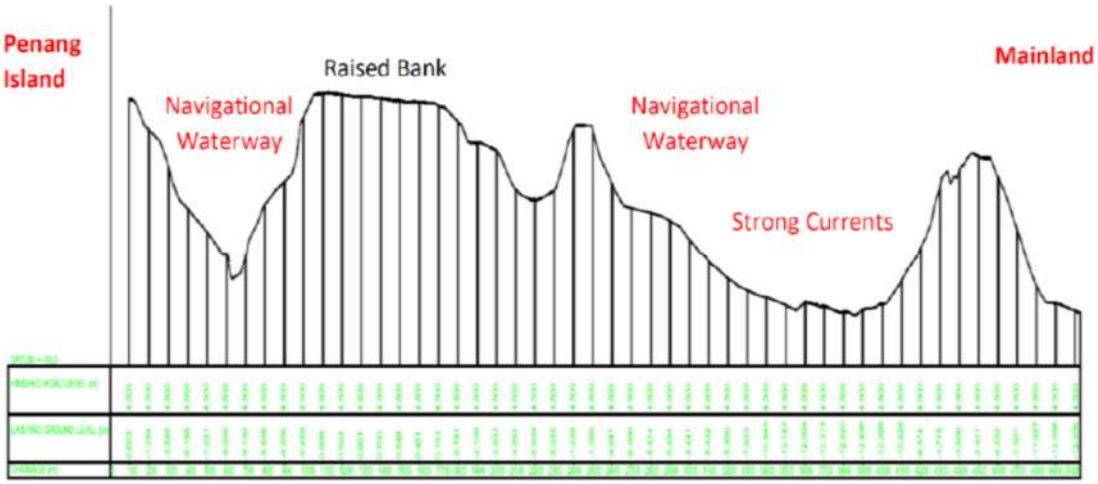


Figure 5.4 | *East Coast Bathymetry*

5.1.4 Option 4: South Coast of Penang Island

The South Coast of Penang Island (*Figure 5.5*) has natural embayment with benign currents. The area is also in close proximity to Bayan Lepas FIZ, the Penang Airport and the Penang Second Bridge. This provides better utilization of the existing infrastructure. The South Coast also has shallow seabed with a general depth of 2 meters at Lowest Astronomical Tide (LAT) *(Figure 5.6)*. This minimizes the reclamation cost as well.

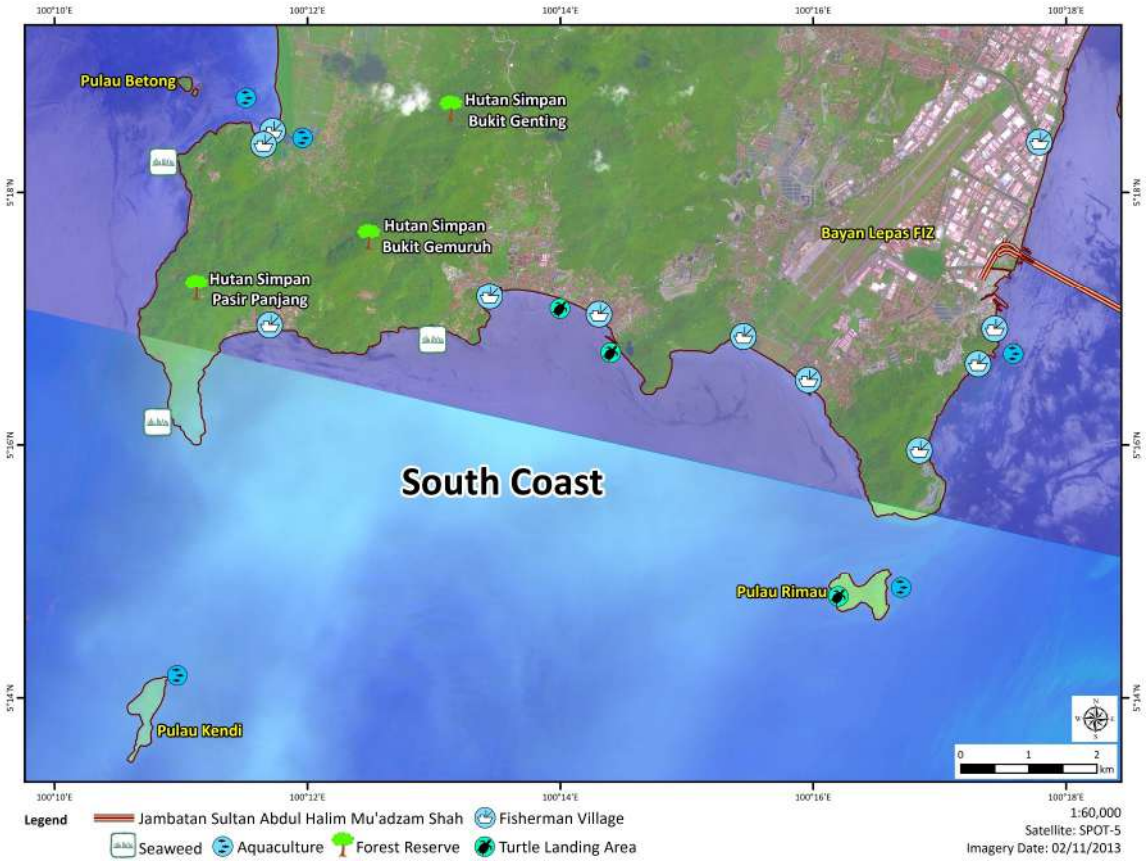


Figure 5.5 I *South Coast of Penang Island*
Sources: 1. RSNPP 2020; 2. Fisheries Department; 3. RFZPPN; 4.ISMP Pulau Pinang

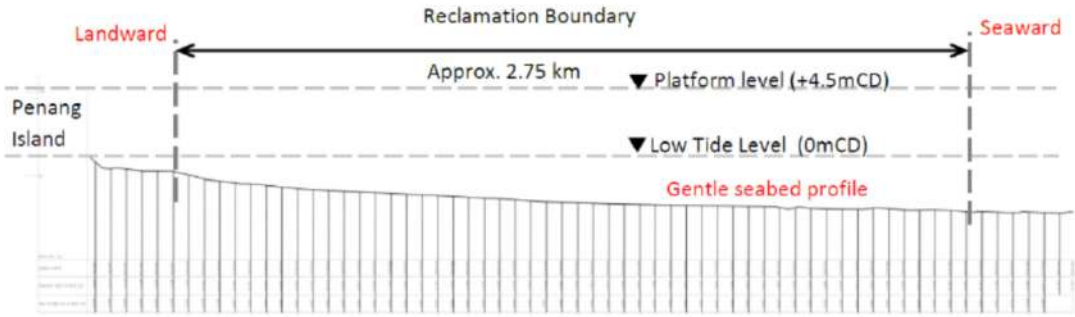


Figure 5.6 I *South Coast Bathymetry*

5.2 Layout Options

Several layout options were explored to choose the best possible shapes of the islands. This is to ensure that the development will be most sustainable and feasible in the long run. *Table 5.1* shows the layout options and the details of the choosing process.

Table 5.1 I *Layout Option*

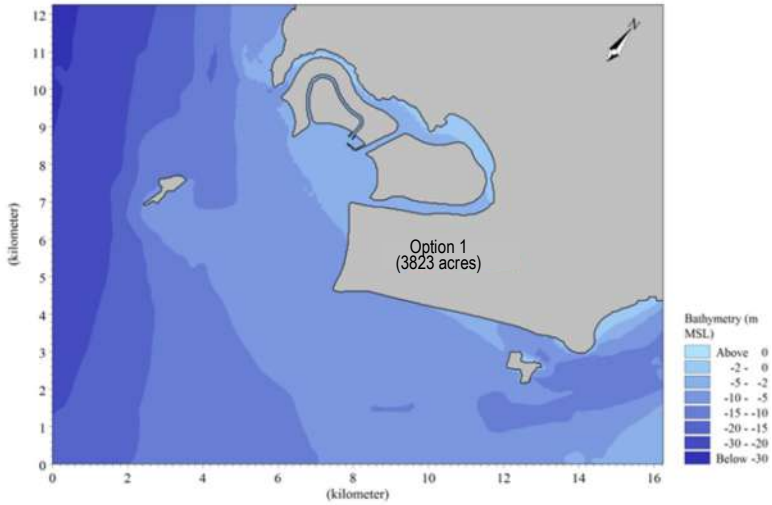
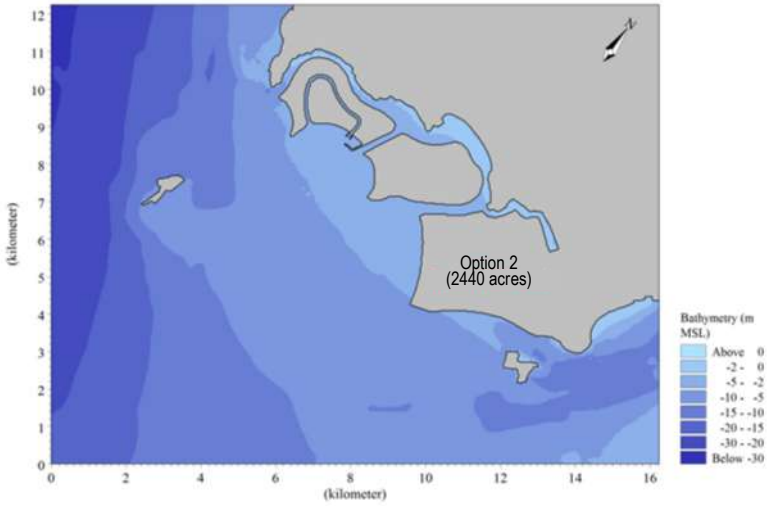
Options	Details
Option 1: Island A abutting Penang Island (3,823 acres) 	For Option 1, the area of Island A is 3,823 acres and is abutting to Penang Island. The distance of Island A is 553 meters away from Pulau Rimau and 300 meters away from the nearest lighthouse. The decrease of water current speed at Tanjung Teluk Tempoyak may cause siltation problems. There will also be an increase of current speed at Island A due to its sharp edge.
Option 2: Island A partially separated from Penang Island at west (2,440 acres) 	Layout Option 2 has Island A to have an area of 2,440 acres, partially separated from the Penang Island at the western side. It allows a minimum of 200 meters width of navigation channel for fishermen at the western part of Island A and mainland. The water current speed is expected to increase at the navigational channel at Permatang Damar Laut towards Tanjung Chut. This will keep the channel depth safe for the fishermen to ply through. However, maintenance dredging is proposed to conducted periodically at the access channel between Island A and Island B. It provides better access for the fishermen villages within the area

Table 5.1 (cont'd) I *Layout Option*

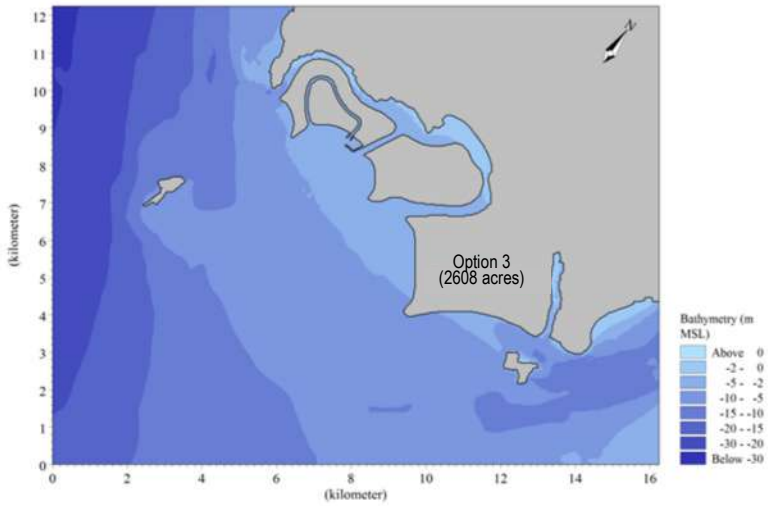
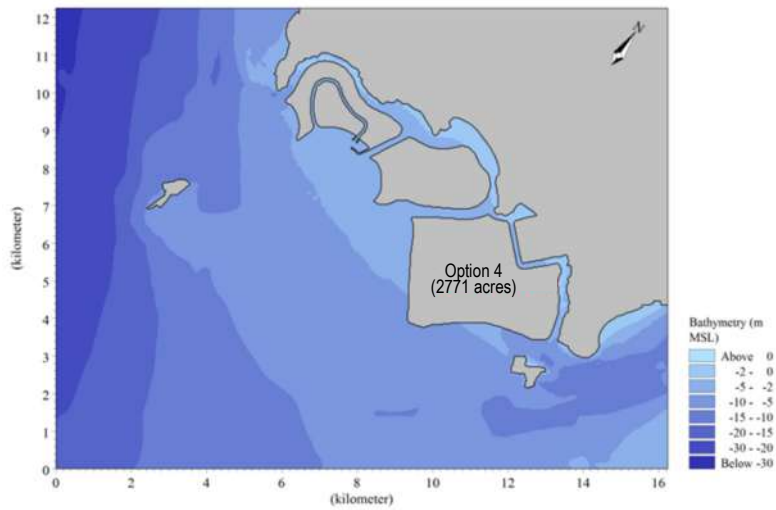
Options	Details
Option 3: Island A partially separated from Penang Island at east (2,608 acres) 	Layout Option 3 has Island A to have an area of 2,608 acres, partially separated from the Penang Island at the eastern side. It allows a minimum of 200 meters width of navigation channel for fishermen at the eastern part of Island A and mainland. The increase of water current speed between Tanjung Chut to Teluk Kumbar and Island A can give better flushing capacity inside the navigational channel. This may help improve the water quality at the area.
Option 4: Island A (2,771 acres) 	The area of Island A for layout Option 4 is changed to 2,771 acres. This layout allows a minimum of 200 meters width of navigation channel for fishermen at the eastern part of Island A and Penang Island. It also allows a minimum of 120 meters width of access channel between the airport expansion area and Island A. The beach at the right and lower part of Island A is reshaped to gain more areas. This option is better minimal changes are expected inside the navigational channel except for the sharp edge of Island A close to Tanjung Chut and Permatang Damar Laut.

Table 5.1 (cont'd) I *Layout Option*

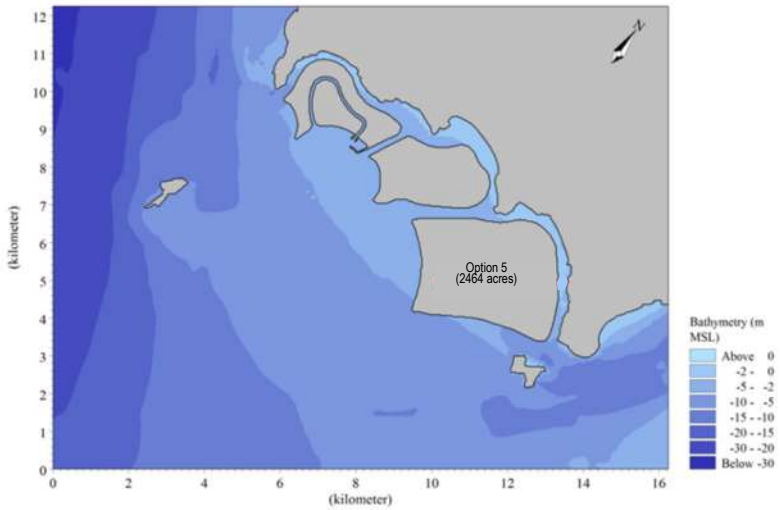
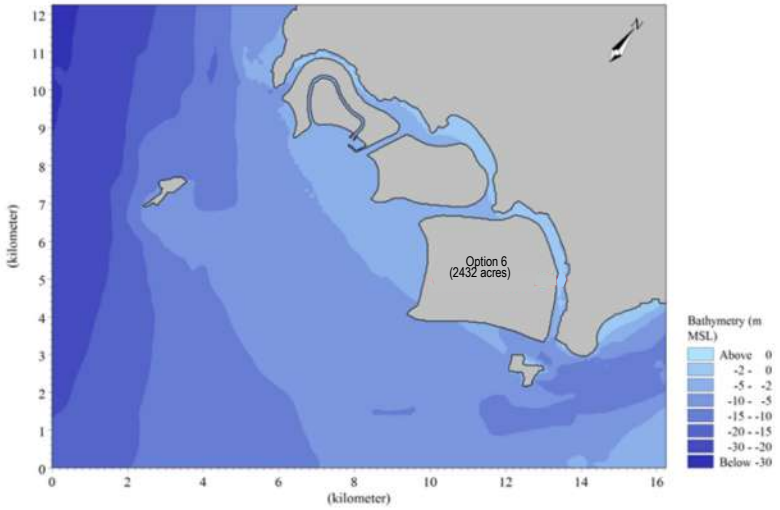
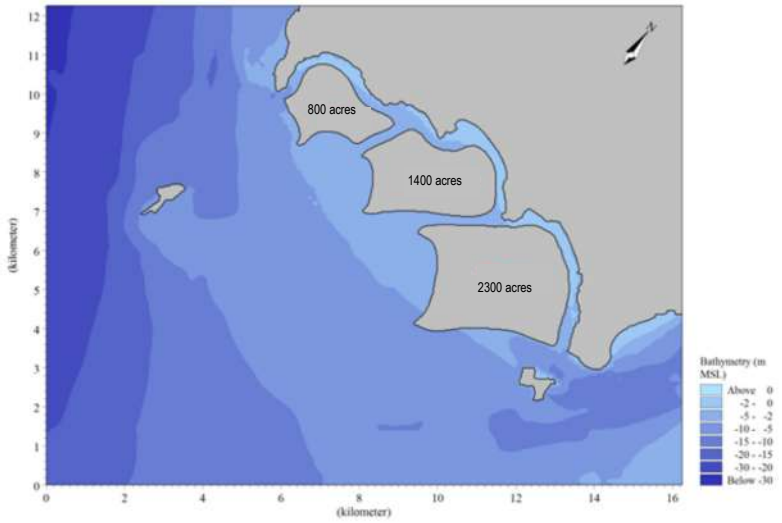
Options	Details
Option 5: Island A (2,464 acres) 	In Option 5, the area of Island A has been decreased to 2,464 acres. This layout still allows a minimum of 200 meters width of navigation channel for the fishermen. For this option, the sharp edge at the tip of Island A is minimized. This reduces the water current speed which consequently decrease the possibility of erosion.
Option 6: Island A (2,432 acres) 	Option 6 has Island A with an area of 2,432 acres. This layout allows a minimum of 200 meters width of navigation channel for the fishermen. There will be a decrease of the water current speed at Tanjung Teluk Tempoyak which may cause siltation problem. Maintenance dredging may be required periodically. There will also be an increase of maximum water current speed about 200 meters along the southern tip of Island A which may cause erosion. This requires protection structures to be built along the possible eroded area of Island A.

Table 5.1 (cont'd) I *Layout Option*

Options	Details
Option 7: Island A (2,300 acres), Island B (1,400 acres) and Island C (800 acres) 	Option 7 has Island A with an area of 2,300 acres. Maintenance dredging may be required at Tanjung Teluk Tempoyak and Gertak Sanggul due to the decrease of current speed at the navigational channel. However, there will be an increase of current speed inside the navigational channel at Permatang Damar Laut which allows a safe depth for the fishermen to access. The increase in current speed will also allow better flushing capacity which will improve the water quality. High current speed is expected to occur at the entrance of the marina at Island C which can cause sedimentation. Frequent maintenance dredging should be considered. Even so, due to the availability of easy navigation for the fishermen, this layout is chosen.

5.3 No Build Option

The no build option assumes that the proposed PSR project is not implemented. The PSR acts as a funding model to the PTMP project. This will hinder the carryon of the PTMP project which subsequently impedes the projected economic growth. Not only that, the traffic congestion Penang Island is facing will not be solved.

07 Approach & Methodology

This chapter provides a detailed description on the methodologies, locations, parameters and guidelines in the baseline information collection and impacts assessment. The approach and methodology be assessed according to the following:

i) Physical environment;
ii) Biological environment;
iii) Human environment; and
iv) Environmental Economic Valuation (EEV).

7.1 Physical Environment

7.1.1 Water Quality

The water quality sampling will include marine and river waters within the project area. Seventeen (17) sampling stations were identified as shown in *Table 7.1* and *Figure 7.1*.

Table 7.1 I *Coordinates of Water Quality Sampling Stations*

Point	Latitude, N	Longitude, E
WQ1	5° 14' 19.01"	100° 11' 0.34"
WQ2	5° 16' 22.154"	100° 9' 13.46"
WQ3	5° 16' 56.5 "	100° 11' 53.9"
WQ4	5° 16' 59.7"	100° 12' 33.5"
WQ5	5° 16' 54.96 "	100° 13' 36.24"
WQ6	5° 16' 40.04"	100° 15' 3.19"
WQ7	5° 16' 56.9"	100° 15' 28.2"
WQ8	5° 16' 10.527"	100° 17' 37.68"
WQ9	5° 15' 7.52"	100° 16' 24.54"

Point	Latitude, N	Longitude, E
WQ10	5° 14' 5.429"	100° 17' 59.24"
WQ11	5° 12' 56.51"	100° 14' 49.159"
WQ12	5° 14' 12.098"	100° 13' 2.447"
WQ13	5° 17' 16.7"	100° 13' 31.4"
WQ14	5° 17' 3.49"	100° 14' 10.87"
WQ15	5° 15' 39.6"	100° 11' 38.4"
WQ16	5° 15' 39.6"	100° 12' 50.4"
WQ17	5° 15' 3.6"	100° 14' 13.2"

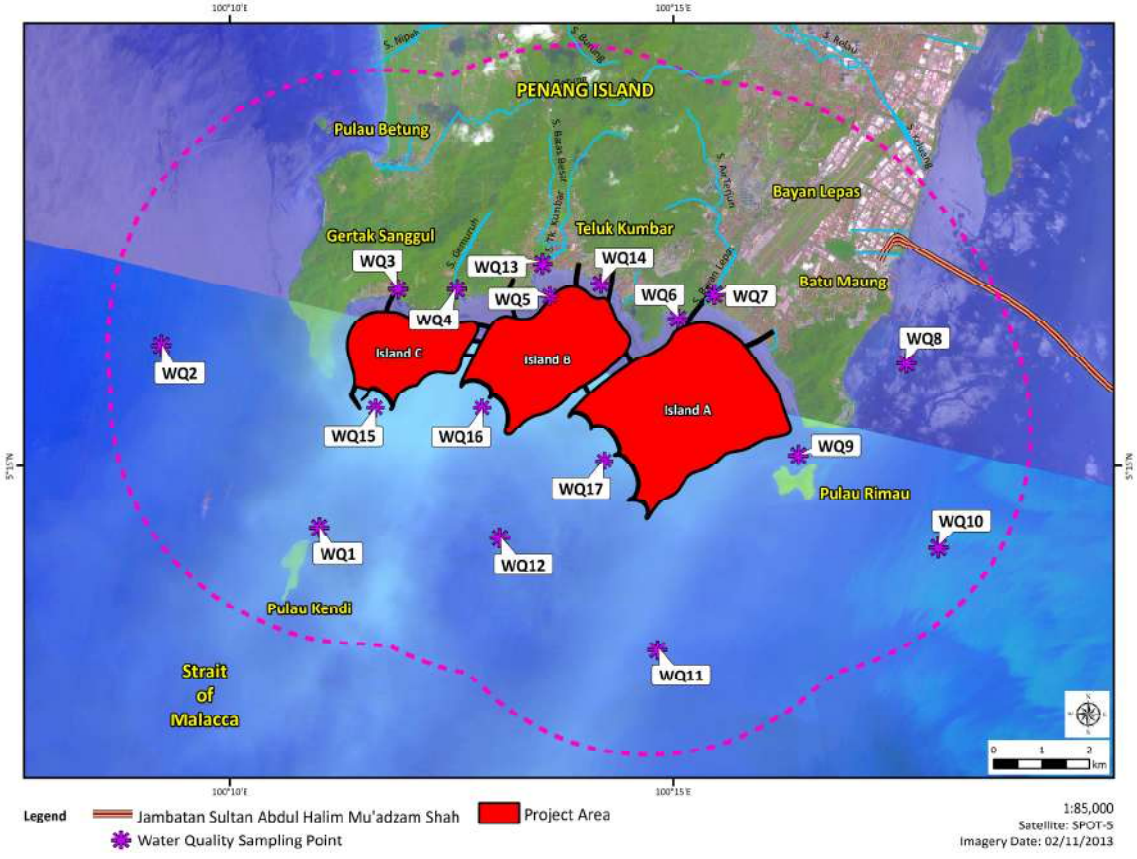


Figure 7.1 I *Water Quality Sampling Stations*

7.1.1.1 Methodology

The water will be sampled at three depths (surface, middle and bottom) for each station, depending on the depth of the water. Physical parameters such as pH, temperature, salinity, conductivity, dissolved oxygen and turbidity will be measured in-situ. For laboratory analysis, the chemical parameters will be chemical oxygen demand (COD), biochemical oxygen demand (BOD), total suspended solids (TSS), ammoniacal nitrogen (AN), phosphate, nitrate, heavy metals (Cr, Cd, Ni, Fe, Pb, Mn, Zn), and oil & grease. After the water samples are taken, these will be stored in clean, airtight, two-litre bottles and kept in a cooler box for temporary storage before being delivered to the laboratory within 6 hours of sampling for analysis. All sampling and test procedures will be conducted in accordance with APHA Standards. The water-quality parameters that will be studied are in accordance with the DOE's "Environmental Impact Assessment Guidelines for Coastal and Land Reclamation". The water-quality parameters involved are listed in *Table 7.2*.

Table 7.2 | *Water Quality Parameters*

Item	Parameters
Physical	Temperature, salinity, pH, conductivity, turbidity, DO, TSS
Anions	Ammonical nitrogen, phosphate, nitrate
Cations/Heavy Metals	Cr, Cd, Cu, Ni, Fe, Pb, Mn, As
Organics	BOD, TOC, oil and grease
Mircobial	*E.coli*
Number of Stations	Saline Water - twelve (12) Estuarine - five (5)
Depths	Three depths (surface, middle, bottom)
Tides	Spring and neap (flooding and ebbing)

7.1.1.2 Environmental Quality Criteria

The marine water samples will be compared to the Malaysian Marine Water Quality Criteria and Standard (MWQCS) and Class E (Mangroves, Estuarine & River Mouth Water) as tabulated in *Table 7.3*.

Table 7.3 I *Malaysian Marine Water Quality Criteria and Standard (MWQCS)*

Parameter	Class 1	Class 2	Class 3	Class E
Beneficial Uses	Preservation, Marine Protected Areas, Marine Parks	Marine Life, Fisheries, Coral Reefs, Recreational and Mariculture	Ports, Oil & Gas Fields	Mangroves, Estuarine & River Mouth Water
Temperature (°C)	≤2°C increase over maximum ambient	≤2°C increase over maximum ambient	≤2°C increase over maximum ambient	≤2°C increase over maximum ambient
Dissolved Oxygen (mg/L)	>80% saturation	5.0	3.0	4.0
Total Suspended Solid (mg/L)	25 mg/L or ≤10% increase in seasonal average, whichever is lower	50 mg/L (25 mg/L) or ≤10% increase in seasonal average, whichever is lower	100 mg/L or ≤10% increase in seasonal average, whichever is lower	100 mg/L or ≤30% increase in seasonal average, whichever is lower
Oil & Grease (mg/L)	0.01	0.14	5	0.14
Mercury* (µg/L)	0.04	0.16 (0.04)	50	0.5
Cadmium* (µg/L)	0.5	2(3)	10	2
Chromium (VI)(µg/L)	5	10	48	10
Copper (µg/L)	1.3	2.9	10	2.9
Arsenic (III)* (µg/L)	3	20 (3)	50	20 (3)
Lead (µg/L)	4.4	8.5	50	8.5
Zinc (µg/L)	15	50	100	50
Cyanide (µg/L)	2.0	7.0	20	7
Ammonia (unionized) (µg/L)	35	70	320	70
Nitrite (NO_2) (µg/L)	10	55	1,000	55
Nitrate (NO_3) (µg/L)	10	60	1,000	60
Phosphate (µg/L)	5	75	670	75
Phenol (µg/L)	1	10	100	10
Tributyltin (TBT) (µg/L)	0.001	0.01	0.05	0.01
Faecal Coliform (Human health protection for seafood consumption) - (MPN)	70 faecal coliform/100 mL 70 *E. Coli*/100 mL	100 faecal coliform/100 mL 100 *E. Coli*/100 mL	200 faecal coliform/100 mL 200 *E. Coli*/100 mL	100 faecal coliform/100 mL 100 *E. Coli*/100 mL
Polycyclic Aromatic Hydrocarbon (PAHs) ng/g	100	200	1,000	1,000

7.1.2 Sediment Quality

Five (5) sediment sampling stations are selected and the coordinates are shown in *Table 7.4*. The locations are depicted in *Figure 7.2*.

Table 7.4 | *Coordinates of Sediment Quality Sampling Stations*

Point	Latitude, N	Longitude, E
SQ1	5° 16' 10.48"	100° 11' 14.83"
SQ2	5° 16' 51.88"	100° 11' 53.67"
SQ3	5° 16' 50.14 "	100° 12' 37.01"
SQ4	5° 17' 8.71"	100° 13' 33.23"
SQ5	5° 16' 39.91"	100° 15' 13.61"

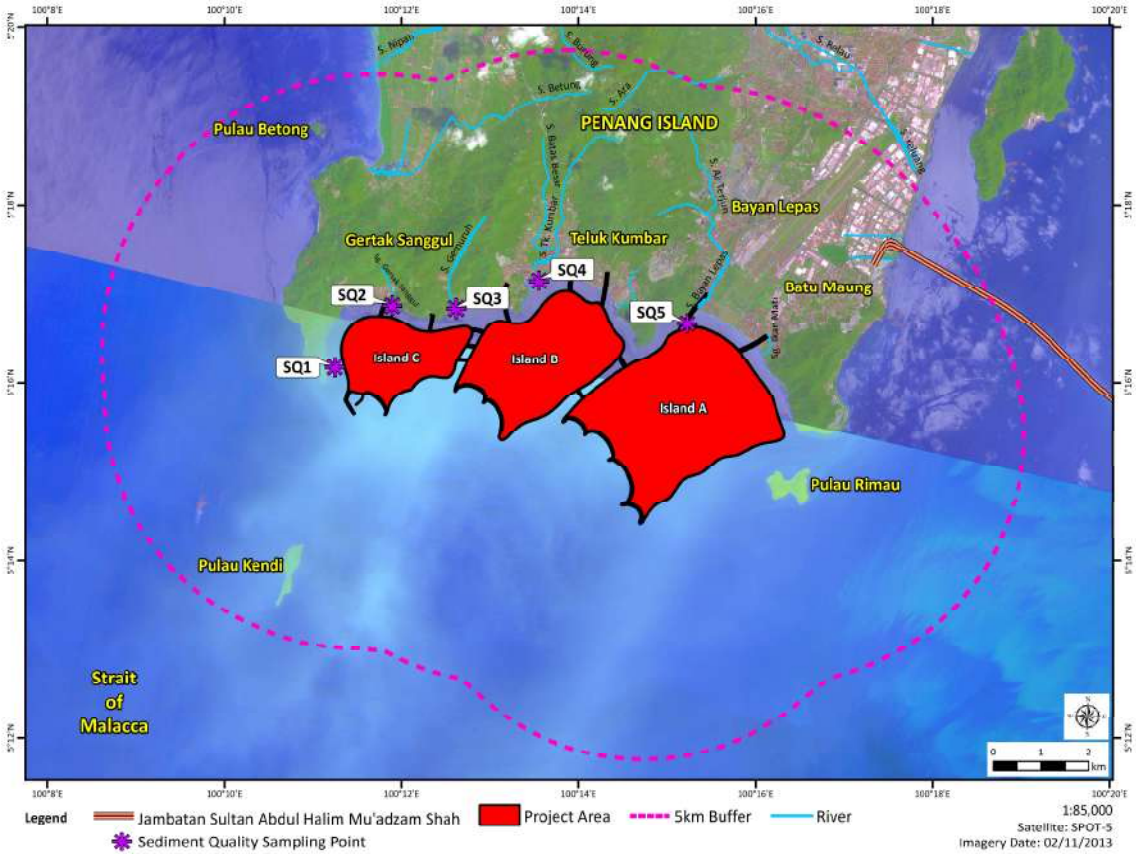


Figure 7.2 | *Sediment Quality Sampling Stations*

7.1.2.1 Methodology

Sediment samples will be taken using a Van Veen Grab whereby the grab will be lowered vertically into the seabed. The closure of the grab bucket is then triggered when it touches the bottom of the sediment. The grab is then pulled up and the sediment samples will be kept in a labeled plastic bag prior to lab analysis. Chemical analyses will be done in accordance to the relevant standards. The sediment quality will be tested for the parameters as listed in *Table 7.5.*

Table 7.5 I *Sediment Quality Parameters*

Parameter	Units	Method Used
Zinc as Zn	mg/kg	APHA 3120 B, 1995
Nickel as Ni	mg/kg	APHA 3120 B, 1995
Copper as Cu	mg/kg	APHA 3120 B, 1995
Chromium as Cr	mg/kg	APHA 3120 B, 1995
Lead as Pb	mg/kg	APHA 3120 B, 1995
Arsenic as As	mg/kg	APHA 3120 B, 1995
Cadmium as Cd	mg/kg	APHA 3120 B, 1995

7.1.2.2 Environmental Quality Criteria

Chemical analyses will be done in accordance with the US EPA Standard (*Table 7.6*).

Table 7.6 I *US EPA Standard*

Parameter	Unit	US EPA Standard		
		Non-Polluted	Moderately Polluted	Heavily Polluted
Zinc as Zn	mg/kg	<90	90 – 200	>200
Nickel as Ni	mg/kg	<20	20 – 50	>50
Lead as Pb	mg/kg	<40	40 – 60	>60
Arsenic as As	mg/kg	<3	3 – 8	>8
Cadmium as Cd	mg/kg	-	-	>6
Copper as Cu	mg/kg	<25	25 – 50	>50
Chromium as Cr	mg/kg	<25	25 – 75	>75

7.1.3 Air Quality

Baseline ambient air quality will be measured at three (3) locations as shown in *Table 7.7* and *Figure 7.3*. The air quality stations shall be located at the nearest air sensitive receptors.

Table 7.7 | *Coordinates of Air Quality Sampling Stations*

Point	Latitude, N	Longitude, E
AQ1	5° 16' 58.49"	100° 11' 46.295"
AQ2	5° 17' 26.32"	100° 13' 58.69"
AQ3	5° 16' 28.95 "	100° 15' 59.58"

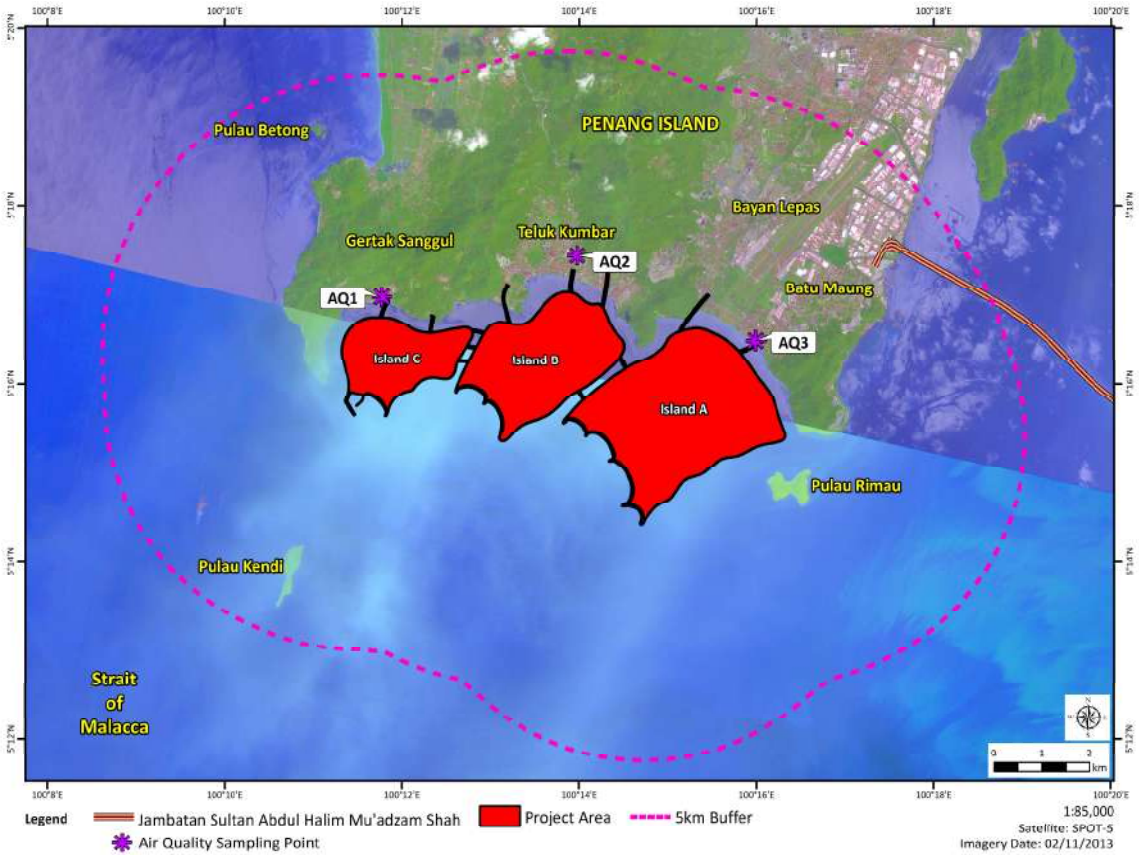


Figure 7.3 | *Air Quality Sampling Stations*

7.1.3.1 Methodology

The ambient air from the surrounding area will be collected using absorbing media via a pre-calibrated portable pump stationed at fixed points. The monitoring will be carried out for duration of 24 hours. The air samples are then analysed at the laboratory for the concentrations of relevant parameters using the standard specifications method as shown in *Table 7.8*.

Table 7.8 I *Standard for Ambient Air Quality Analysis*

Parameters	Standard Specifications	
TSP	AS 2724.3	Determination of Suspended Particulate Matter (TSP) - High Volume Sampler Gravimetric Method (24 hours average)
$PM_{2.5}$	AS/NZS 3580.9.13:2013	Determination of $PM_{2.5}$ (24 hours average)
PM_{10}	AS 3580.9.6	Determination of PM_{10} (24 hours average)
SO_2	ISC 704A	Determination of SO_2 (24 hours average)
NO_2	ISC 408	Determination of NO_2 (1 hour average)

7.1.3.2 Environmental Quality Criteria

The air quality sampling results will be compared with the Recommended Malaysian Air Quality Guidelines (RMAQG) as shown in *Table 7.9*.

Table 7.9 I *Recommended Malaysian Air Quality Guidelines (RMAQG)*

Parameters	Averaging Time	Level (ug/m^3)
Total Suspended Particulate (TSP)	24 hours	260
Particulate Matter (PM_{10})	24 hours	150
Particulate Matter ($PM_{2.5}$)	24 hours	75
Sulphur dioxide (SO_2)	24 hours	105
Nitrogen dioxide (NO_2)	1 hour	320

7.1.4 Noise

Noise measurements will be conducted to establish the existing noise levels at three (3) locations within the study area as shown in *Table 7.11* and *Figure 7.4*. The noise level measurement shall be located at the nearest noise sensitive receptors.

Table 7.11 | *Coordinates of the Noise Sampling Stations*

Point	Latitude, N	Longitude, E
N1	5° 16' 58.49"	100° 11' 46.295"
N2	5° 17' 26.32"	100° 13' 58.69"
N3	5° 16' 28.95 "	100° 15' 59.58"

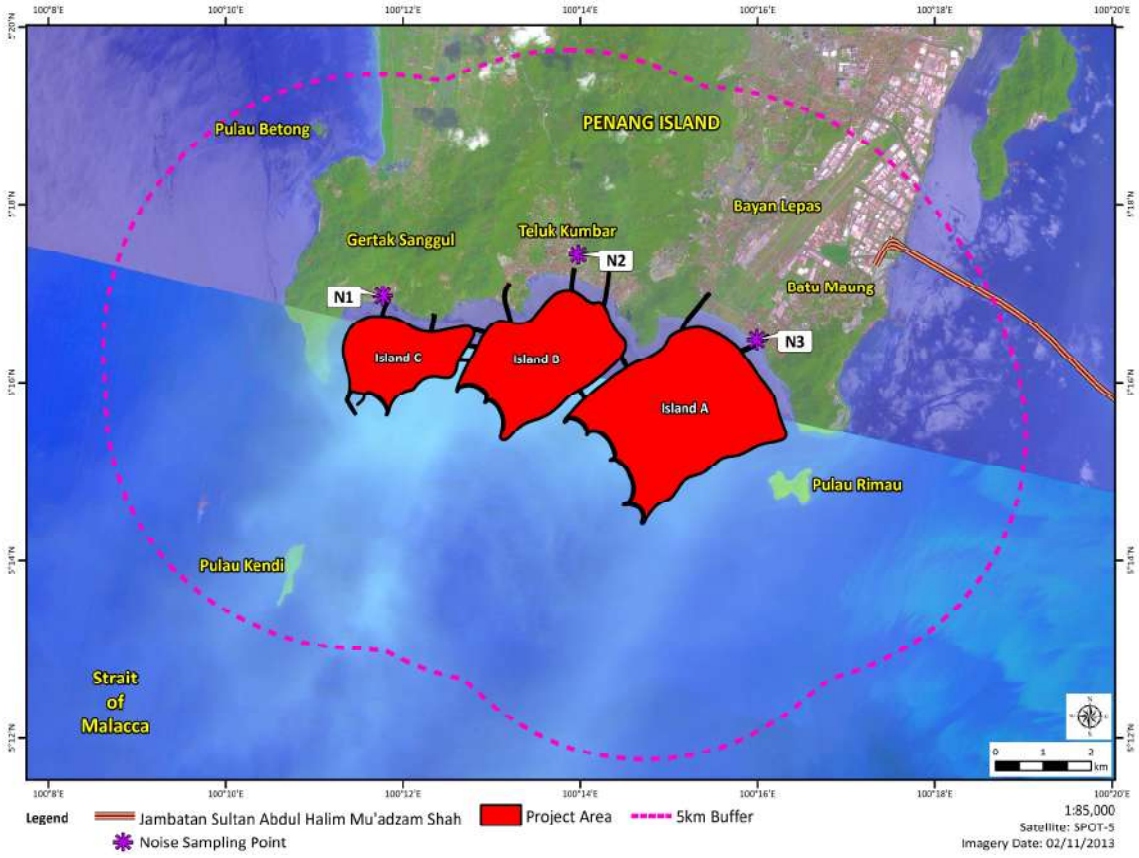


Figure 7.4 | *Noise Sampling Stations*

7.1.4.1 Methodology

Existing noise levels' measurements will be performed according to Annex C, Planning Guidelines for Environmental Noise Limits and Control issued by the Department of Environment. The sound level meter will be placed at a height of about 1.2 m above the ground on a tripod. The guidelines specify that the sampling time should be "continuous day-night sampling". The sound-level meter will be calibrated onsite each day before the first measurement is taken and after the final measurement completes. The noise parameters that will be measured are:

i) Equivalent Continuous Sound Level (L_{eq});
ii) Statistical Indices (L_{10}, L_{50} and L_{90}); and
iii) Maximum Noise Level (L_{max}).

7.1.4.2 Environmental Quality Criteria

The noise sampling results will be compared with the DOE's Interim Guidelines for Maximum Permissible Sound Levels by Receiving Land Use (Schedules 1 and 2).

7.1.5 Hydrology and Drainage

The study will perform an initial assessment of the Penang South Coast river system and determine initial mitigation solutions. The meteorological and climate of the Project site shall also be assessed in terms of the monthly rainfall, flooding condition, hydrological, hydraulic and low flow analyses. This shall include the assessment of backflow and flood issues.

7.1.5.1 Methodology

This section discusses the data collection for this study. Gathering and managing data form a major part in developing the successful water quality assessment in various scales. In order to perform a holistic assessment of the river system in the southern coast of Penang, liaison was made with appropriate and relevant government agencies for available data.

The sources of data collected and acquired are generally from the relevant authorities, agencies, previous reports, field work and third parties such as surveyors and consultants. In this study, the amount of data collected and acquired will be essential. As such, they should be kept and managed in an orderly manner so that they can be easily located, retrieved and updated. Nevertheless, it should be noted that the above data requirements could be expanded in respect to the necessity of the study requirement.

7.1.6 Soil Characteristic

The study includes descriptions of existing geological features and processes within the project site. This will include the rocks and soils, the landforms along the coast and the geological processes such as deposition, material transport and erosion.

7.1.6.1 Methodology

The geological conditions at the site will be determined by conducting field investigations and sampling together with reference to earlier studies and published information.

Meanwhile, soil investigation (SI) results from the area will be used to describe the subsurface conditions at the areas which will be reclaimed. The description of the existing geo-environment conditions and processes will form the basis of assessment of the potential environmental impacts of the reclamation and the proposed mitigating measures.

7.1.7 Marine Traffic and Navigation

The key elements of this sector shall comprise the following:

i) Description of existing marine traffic within the Project site;
ii) Description of existing marine facilities and structures;
iii) Future utilization;
iv) Marine traffic accident statistics (sources include Port Authority, Marine Department and other data sources);
v) Navigation approach channels;
vi) Potential impacts to the existing marine traffic and navigation safety; and
vii) Appropriate proposal for mitigation measures to reduce the impact on navigation safety both during construction and operational stages.

However, Marine Traffic Risk Assessment (MTRA) is not part of this Marine Traffic and Navigation Study.

7.1.7.1 Methodology

The assessment will be carried out using qualitative and quantitative methods including local knowledge, experience, local authorities and agencies, interviews with fishermen, local communities and locals who are likely to be affected by the project.

7.1.8 Land Traffic

A traffic impact assessment (TIA) will be carried out to evaluate the existing traffic flow on the surrounding road network. The TIA study will assess the impact of the proposed development onto the existing traffic flow in the vicinity of the project. The impacts will be addressed in a form level of service (LoS) and traffic flow pattern. Appropriate mitigation measures will be recommended to improve the efficiency and capacity of the existing road network to cope with future traffic.

7.1.8.1 Methodology

The TIA study will be done as follows:

i) Carrying out traffic counts to determine the current traffic volumes of the surrounding road network;
ii) Projecting future traffic generated by the proposed development and its neighbouring developments;
iii) Assessing the traffic impact of the trips generated by the proposed development and its neighbours onto the existing and future road network; and
iv) Recommending a suitable traffic circulation system.

Current peak hour traffic volumes on the roads within the study area will be determined from classified manual traffic counts.

7.1.9 Hydraulic Study

A hydraulic study shall be conducted to assess potential impacts to the coastal environment from the project and to formulate mitigation measures. The study shall be performed complying with *Jabatan Pengairan Saliran* (JPS) Malaysia's 'Guidelines for the Preparation of Coastal Engineering Hydraulic Study and Impact Evaluation (for Hydraulic Studies Using Numerical Models): Fifth Edition' (December 2001) prepared by DID and DID's letter on additional requirements for hydrodynamic modelling dated 11th June 2013 [ref. no. (45)dlm.PPS.14/2/23 Jld 2].

The hydraulic study shall be conducted in three phases:

i) **Phase 1 - Primary and secondary data collection**
Existing data will be collated and areas of missing or lacking knowledge identified. Field surveys will be initiated to address shortfalls in existing data sets to obtain sufficient detail, spatial and temporal coverage of data for the existing condition. This phase is divided into sourcing of existing data, field and secondary data collection.

ii) **Phase 2 - Numerical modelling**
Numerical modelling will be utilised to assess impact of the proposed land reclamation upon the marine environment, the main issues being impact upon water exchange and resulting impact upon marine ecosystems, sedimentation and/or erosion and flooding.

iii) **Phase 3 - Analysis and Recommendation**
Model results shall be assessed and analysed. Identification of short and long term potential impacts shall be done. Recommendations for appropriate mitigation measures shall then be made.

7.1.9.1 Phase 1 - Primary and Secondary Data Collection

Primary Data

Data is available from various government departments and agencies including Malaysia Meteorological Department, DOE and JPS as well as studies performed for projects in its vicinity. The data includes wind data, shoreline conditions, bed levels, currents, wave conditions, bottom sediments, suspended sediments, water quality and marine habitats/ecosystems. The data available from the study and other sources shall be reviewed in the context of the present study.

Discussions with the Project Proponent and related consultants, officers from relevant government authorities, local residents, etc. will be done. Ground reconnaissance enables a better understanding of general met-ocean conditions, coastal processes, shoreline conditions and land-use currently occurring within the project area.

Secondary Data

A field data collection campaign shall be executed to gather the following data necessary for the hydraulic modelling works:

i) *Current flow* - Self-recording current meters have been deployed continuously for 72 hrs each at three stations around the project site during spring and neap periods to assess flow pattern and magnitude.
ii) *Water levels* - An automatic tide gauge has been installed at locations within the project area to record water level fluctuations for two weeks covering a spring and neap cycle.
iii) *Bed sampling* - A bed sediment sampling investigation has been done using a mechanical grab sampler within and around the project area. Samples indicative of the surface bottom sediments have been collected. The samples collected shall be sent to a laboratory for Particle Size Distribution analysis, bulk density, dry density and specific gravity tests.; and
iv) *Suspended solids* - Information on suspended solids is required to assess sedimentation/ erosion as a result of the development. It is also needed to establish background concentrations. Impact assessment can be based upon relative changes rather than absolute values. This enables easier interpretation with respect to potential impacts. Water samples shall be collected using a dedicated water sampler in conjunction with current measurements.

    Samples shall be collected at various depths during each sampling event to determine the suspended sediment concentration within the water column. The samples collected shall be sent to a laboratory for total suspended sediments (TSS) analysis.

In addition, results from a hydrographic and topographic survey shall complement the field data collection works in order to ensure good performance of the numerical model in the vicinity of the project area and within the potential impact area.

7.1.9.2 Phase 2 - Impact Assessment

The assessment of impact due to the proposed reclamation shall primarily be done using *MIKE 21*, a two-dimensional numerical modelling software suitable for application to coastal areas. Simulations shall be carried out for existing and 'with project' conditions.

Task I - Hydraulic Impact

The effect of regional currents shall be simulated by setting up a regional model large enough to cover the northern half of Malacca Strait. Nesting of models shall be done with the regional model having the coarsest grid size and the local grid model with the smallest grid spacing. A local model with a refined grid resolution encompassing the project area shall be used to assess impact due to the proposed development. The model nesting is shown in *Figure 7.5.* The *MIKE 21 HD* (hydrodynamic) model will be used to assess impact on water levels and currents. Effects of seasonal monsoon currents shall be considered.

Fine Grid Model as shown in *Figure 7.5* will include the Penang Second Bridge piers. Effective and reliable model will depends on the availability of detailed information on the bathymetry.

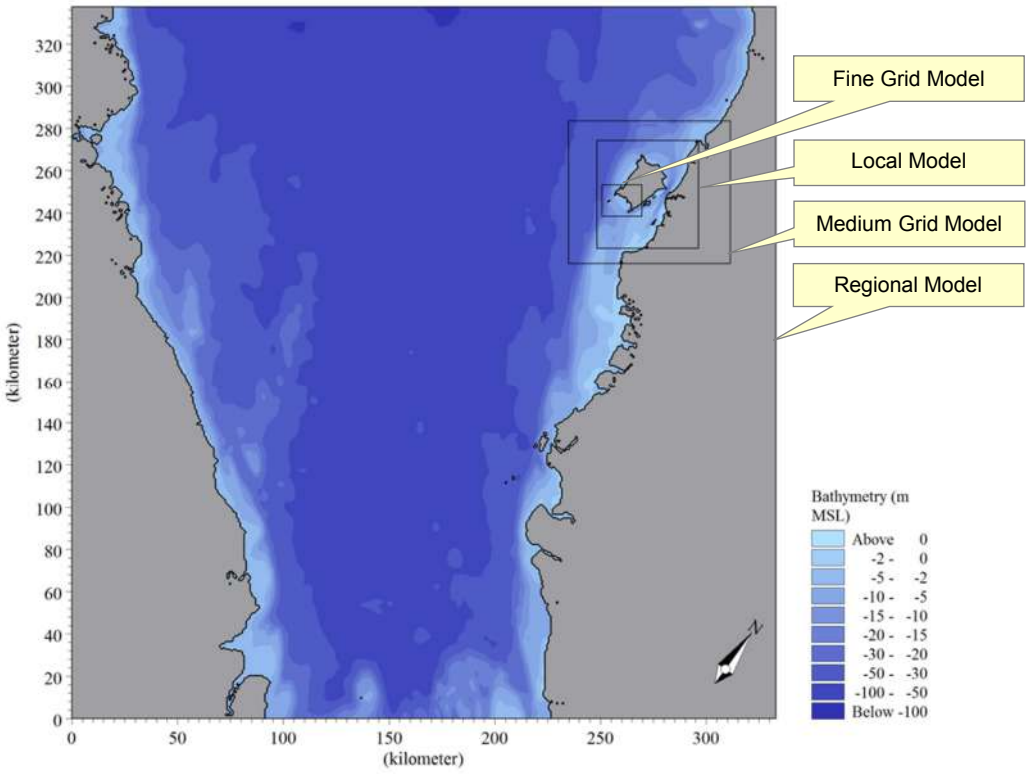


Figure 7.5 | *Model Nesting*

Task II - Wave Impact

Modelling of waves using *MIKE 21 SW* (near shore waves) will be done for various relevant wave heights corresponding to a 50 years return period to ascertain any impact to the proposed development. The model considers effects of refraction, shoaling and wave breaking.

Task III - Sediment Transport Impact

The presence of the proposed development may change the sedimentation pattern of the surrounding area. *MIKE 21 MT* sediment transport model for cohesive bed material shall be used to assess the potential for erosion and sedimentation within and around the proposed development. A comparison between the existing and with development conditions enables identification of increased sedimentation or erosion.

Task IV - Suspended Sediment Plume Impact

The transport and fate of material entering the water column during reclamation or dredging activities is are generally the prime source of impact resulting from marine reclamation projects. This is especially so in environments with sensitive habitats such as sea grass and coral reef, which are highly susceptible to changes in light conditions affected by the shading produced by suspended sediment plumes and sedimentation resulting from deposition of suspended sediments. This assessment will be conducted using *MIKE 21 MT* sediment plume model, which includes the transport, rate and re-suspension of sediments as a result of current and wave action.

Task V - Assessment on Flushing Channel

MIKE 21 AD was used to assess flushing characteristics for the existing and 'with project' conditions that can affect the water quality within and around the Project site. *MIKE 21* Flow Model Advection/Dispersion (AD) module is used for the application of spreading of dissolved substances subject to advection and dispersion processes. In this case, the usage is to initialise a concentration 'tracer', which could be viewed conceptually as a dye in the water being placed in the enclosed area of interest. A uniform concentration of a conservative tracer was placed in the area and the reduction in concentration due to flushing investigated.

Task VII - Flooding Potential

The impact of the development upon water levels at major drainage outlets within 3 km radius of project site will be assessed. Results will be presented as difference in water level between the existing and 'with development' conditions.

7.1.9.3 Phase 3 – Analysis and Recommendation

The existing coastal environment and processes can be determined based on model simulation results. Assessment of impacts on water levels, changes in current and wave regime, bed level changes, fate of sediment dispersion and deposition and flushing shall be done based on simulation results for various development scenarios. Identification of short term and long-term potential impacts shall be done. Recommendations for appropriate mitigation measures will be made.

7.2 Biological Environment

7.2.1 Marine Flora and Fauna

Reconnaissance assessments of the marine resources at the proposed project site including:

i) Benthic fauna diversity and distribution;
ii) Plankton (phytoplankton and zooplankton) diversity and density;
iii) Fish fauna diversity excluding quantitative assessments of stock size and productivity; and
iv) Marine habitats including coral reef health and status.

Concurrently, a Fisheries Impact Assessment (FIA) study is being conducted by FanLi Marine and Consultancy Sdn. Bhd.

7.2.1.1 Methodology

A site visit will be undertaken to familiarise with the problems, constraints, and potentials of the area, vis-à-vis the needs of the project, as well as in developing the study program. This would involve the following:

i) Sampling and identification of benthic macrofauna found in and adjacent the project area;
ii) Sampling and identification of phytoplankton found in and adjacent the project area; and
iii) Sampling and identification of zooplankton found in and adjacent the project area.

The study area appears to be approximately 15 km^2; i.e. about 5 km long (north-south axis) and 10 km wide (east-west axis). A grid sampling system will be developed whereby transect lines are set every 1 km on both the north-south axis and the east-west axis. A total of 16 transect lines i.e. 11 on north-south axis and six (6) on east-west axis are expected to be involved. Based on the grid system, there will be a total of 66 intersection points i.e. 66 sampling stations. The sampling points will be spread within and outside the project boundary. Macrobenthic communities, zooplankton and phytoplankton will be measured. Speciation (up to genera) will be listed together with density. Diversity index analyses (Shannon Weiner) will be provided.

Macrobenthos

For the macrobenthic studies, sampling will involve collection of bottom sediment at the designated sampling stations (66 stations) located within and outside the reclamation boundary. Sampling will also be involved at Pulau Rimau and Pulau Kendi. Locations of sampling points are provided in *Figure 7.6*.

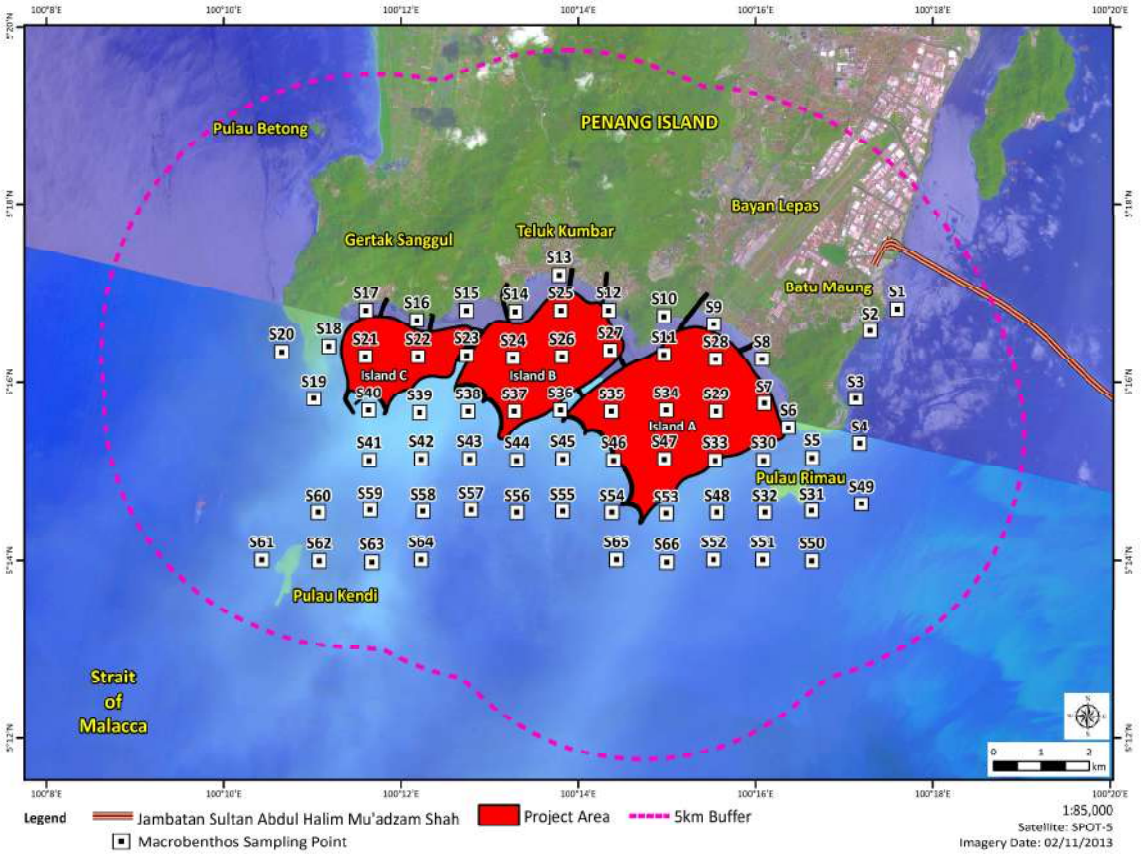


Figure 7.6 I *Locations of the Macrobenthos Sampling Stations (S1-S66)*

Benthic organisms will be sampled using a Van Veen Grab. The samples will be collected in double-layered plastic bags and labelled. On shore, the sediment will be slowly washed through a sieve with a mesh size of 500 µm. The specimens and coarse sediment that were retained in the sieve will be collected in a plastic container, preserved in 10% formalin solution and moved to the laboratory.

Sieved specimens from the sediments will be sorted using an inverted microscope. Benthic samples will be identified at the family and genus/species level using a high compound microscope. Macrobenthos will be enumerated in terms of number of individuals per meter square (ind./m^2).

Phytoplankton

Sampling involved the collection of surface water samples. A total of 25 sampling station will be involved within and outside the reclamation boundary including at Pulau Rimau and Pulau Kendi. Locations of sampling points are provided in *Figure 7.7*.

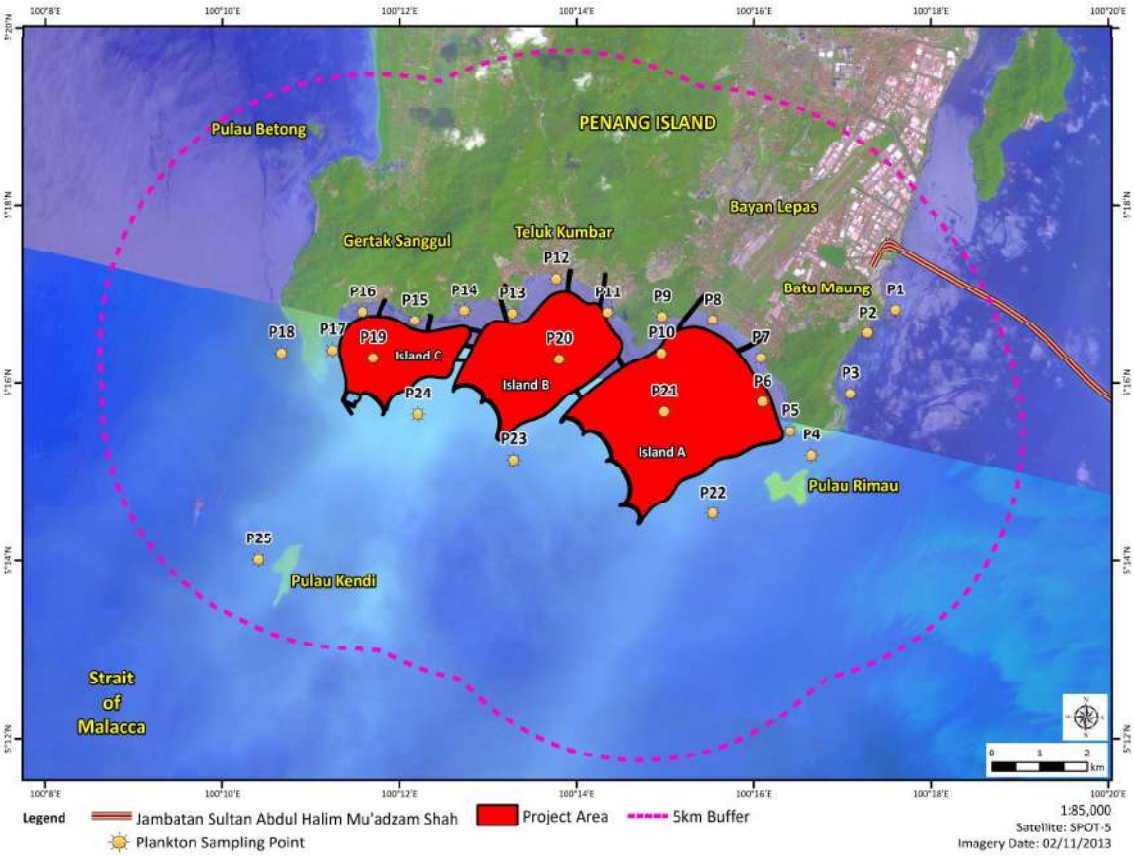


Figure 7.7 | *Locations of the Plankton (Phytoplankton and Zooplankton) Sampling Stations (P1-P25)*

Water will be collected using Niskin Water Sampler and transferred into a 1.5L polyethyelene terephthalate (PET) bottle. Then, immediately the phytoplankton sample will be preserved using 1.5 ml Lugol's iodine solution. Phytoplankton samples will be labelled prior to laboratory analysis.

Phytoplankton composition and diversity will be determined by first concentrating, then sub-sampling and counting using an inverted microscope. Plankton samples will be identified at family and genus/species using a high compound microscope. Phytoplankton will be enumerated in terms of number of cells per millilitres (cells/ml).

Zooplankton

Sampling will also involve the collection of surface water samples. The sampling stations will coincide with the phytoplankton sampling stations. Locations of sampling points are provided in *Figure 7.7*.

20 litres of surface water will be collected using Niskin Water Sampler and filtered through a 140µm plankton net. Zooplankton samples retained on the plankton will be washed into a plastic bottle. 10% formaldehyde will be added as preservatives and labelled prior to laboratory analysis.

Zooplankton composition and diversity will be determined by first concentrating, then sub-sampling and counting using a stereomicroscope. Samples will be identified at family and genus/species using a high compound microscope. Zooplankton will be enumerated in terms of individual per litre (ind./L).

Coral Reef Fishes

The data collection will be based on field assessments of the health, speciation (up to genus or species level), approximate location of the coral reefs and depths but excludes detailed mapping (data on extent, exact location, etc.) is outside the scope.

Coral reef assessment will be carried at Pualu Rimau and Pulau Kendi. At least four (4) dive sites are expected to be involved for each island. Locations of the dives sites are provided in *Figure 7.8*.

The main data that will be gathered would include:

i) Approximate location;
ii) Speciation including its associated fauna (fish and invertebrates) up to genera/species level;
iii) Distribution and percentage coverage; and
iv) Health.

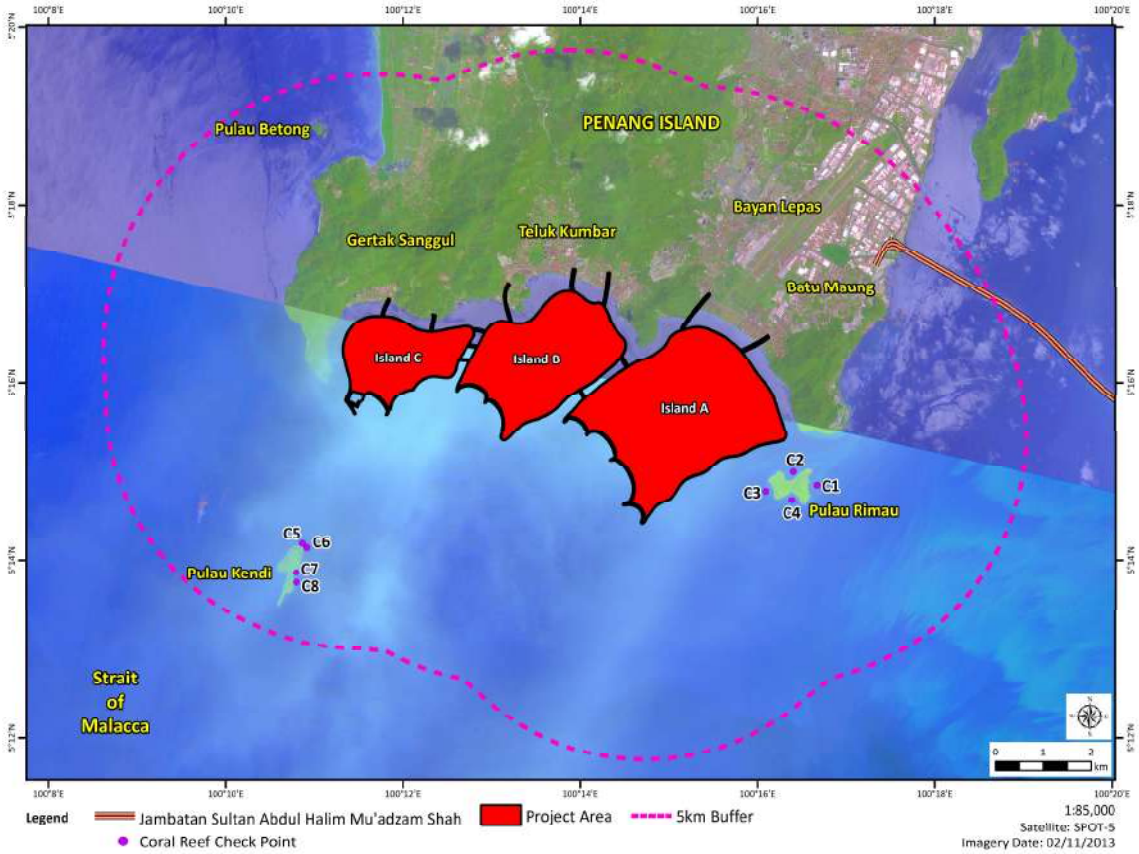


Figure 7.8 I *Locations of the Dive Sites at Pulau Rimau (C1-C4) and Pulau Kendi (C5-C8)*

A cell-based method will be used to assess the sessile benthic community of the coral reefs and establish the diversity, density and health status of reefs at the project area. The proposed survey method would be modified Line Intercept Transect (LIT), involves arranging cells in parallel rows.

The general procedure employed at each site will be as follows:

i) The positions of each cell or lines will be established. Once these positions are established, a team of divers will lay transect lines 100 m long using a measuring tape and delineate a 20 m x 20 m survey cell/quadrate. Each cell/quadrate will have a 5 m interval i.e. a total of four (4) cell/quadrate will be involved for each transect line;
ii) After delineating the quadrate, the divers will leave the survey area for 10 minutes to allow normal fish activity to resume;
iii) The divers will then return, they will would record coral species and other fauna (reef fish and invertebrates) within each quadrate along the transect; and

iv) The coral species and other fauna (reef fish and invertebrates) will be identified up to genera/species level where possible in the field or after the dive were completed using field guidebooks.

Fishes

Sampling will be based on 1 sampling point per 4 km^2. There will also be one (1) sampling point each at Pulau Rimau and Pulau Kendi i.e. a total of six (6) sampling points are expected to be involved. Locations of the sampling points are provided in *Figure 7.9.*

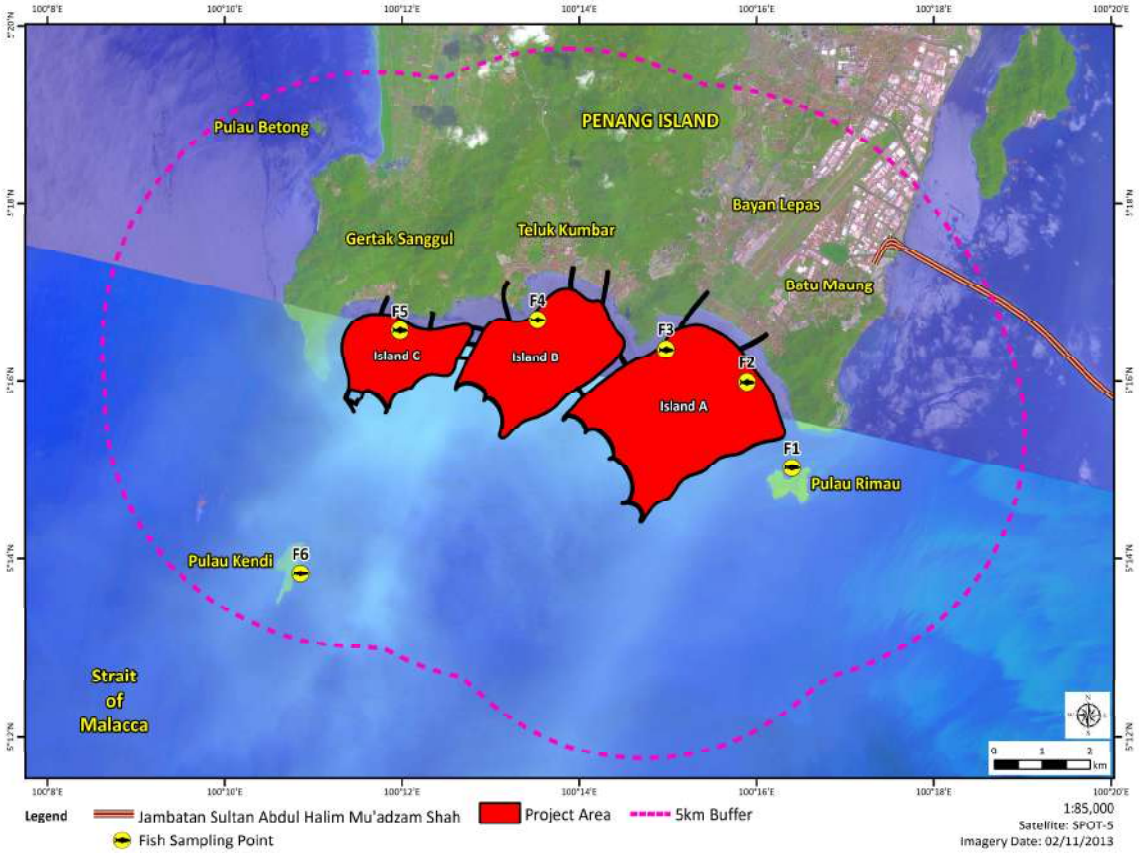


Figure 7.9 I *Locations of Sampling Points for Fishes (F1-F6)*

The main data that will be gathered would include speciation, size/weight and catch per unit effort of fishes in the project area.

For the fishes assessment, fish species will be sampled at the water bodies by gill netting at the designated sampling locations.

At each sampling station:

i) Gill nets with a mesh size of 2.5 cm will be employed;
ii) The net will be employed as barrier nets, with both ends affixed to anchors or stakes;
iii) The net will be affixed for a standard time of two (2) hours;
iv) Fish caught will be collected, separated and identified up to genus or species level;
v) The weight and length measurements will also be recorded for all the fish collected. The total length (TL) of the fish will be measured from the snout until the outer tip of the tail;
vi) A portable weighing scale and measuring tape will be used for weight measurement; and
vii) Photographs of the representative fish specimens will be undertaken. Some fish specimens will be preserved in 10% formalin solution for documentation and record purposes.

7.2.2 Terrestrial Flora

The terrestrial flora will comprise of mangroves, coastal vegetations and forests.

7.2.2.1 Methodology

The terrestrial flora study will be conducted using two methods, namely:

i) Floral survey:
This survey will involve identifying the plant species and mangrove current condition. The plant species identified are then listed. Pilot surveys will be done to familiarize with the sites and routes. Pictures of plants and sites will be taken for reference.
ii) Study plots:
For this study, plots of 100m × 20m (10 subplots of 20m × 10m) and one (1) plot of 30m × 20m (3 subplots of 20m × 10m) will be established. All trees with diameter at breast height (DBH) of 5 cm and above will be measured and identified. Leaves, flowers and fruits samples of plants species identified on sites will be collected and pressed. All trees with diameter at breast height (DBH) at 5 cm and above will be recorded. The species abundance parameters i.e. frequency, density, basal area, importance value index and diversity indices will be calculated following Brower *et al.* (1997), whereas the biomass will be estimated using regression equation as suggested by Clough & Scott (1989). Species of conservation interest or rare will be highlighted based on the IUCN Red List Categories and Criteria for mangrove species (Polidoro *et al.,* 2012).

7.2.3 Terrestrial Fauna

7.2.3.1 Methodology

Sampling procedures for terrestrial fauna study are discussed in the following sections:

Large Mammals

Surveys of large mammals will be conducted for at least three (3) days at the study site along existing trails in their natural habitats. At the study site, the survey will be conducted within a transect of at least 1 km. Any individual species observed (through naked eyes, binoculars or spotting scope) in these surveys will be identified and noted. Mammals are also identified through footprints and droppings that are found during the surveys. Reports from interviews with the locals and other agencies will be included in the mammal species list. Species categories or their status locally [Wildlife Conservation Act 2010 or internationally (IUCN)] are also included in the species checklists.

Small Mammals

For the study of small mammals, two (2) methods will be used: trapping and field observation. Small-mammal trappings are made mostly along established trails. Along these trails, thirty (30) cage traps are laid (on the ground) at 10-15 m intervals. Traps are baited alternately either with banana, oil palm seeds, or jackfruit. Traps are serviced twice a day (morning and evening) and will be left open for three (3) continuous days and nights. Each of the trapped small mammals will be examined for species identification, and released at the point of capture (Medway, 1977).

Bats

Bat trappings are made at the same sites as with trapping terrestrial small mammals (non-volants). For the study of bats, field trapping is required, using harp traps and mist-nets. Nettings are made randomly along any established trail using 10 mist nets that are set at about 1.5 m to 2 m above ground. The nets are serviced twice: in the evening at 2000hr and in the morning between 0600hr-0900hr. Other than nets, two (2) harps traps will also be used to catch insectivorous bats. The bats captured are examined for species identification (Medway, 1983) and then released at the point of capture.

Birds

The objective of the survey is to obtain an inventory of the avifauna of the study area, by using visual and audio identification methods besides mist netting. At the study site, at least 2-3 persons will be involved in the observations for at least three (3) days along the selected established trails, which include existing tracts and access roads. Bird observations are made early in the morning at 0700hr until 1100hr and between 1700hr to 1800hr. Along selected established trails, 10 mist-nets will be set for three (3) continuous days at each site. The nets are randomly set at about 1.5 m above ground. Nets are inspected every two hours - twice in the morning and twice in the evening. The birds netted are released after identification at the point of capture (Davison, *et al.* 1989; Jeyarajasingam & Pearson, 1999; Madoc, 1976, 1985; Pettingill, 1970).

Herpetofauna

Sampling of reptiles and amphibians will be conducted at night by active searching and visual encounter surveys with the aid of a headlamp and a clamping rod (for snakes). Specimens will be identified or photographed upon capture and then released on site. Unidentified specimens will be taken back to the laboratory for further taxonomic classification (Inger & Stuebing 1999). Checklists of the herpetofauna will be recorded in the EIA report.

7.3 Human Environment

Knowledge of the existing human environment of the project area is crucial before assessment of the impacts of the project on the population and the surrounding areas can be carried out. As such, the study would seek to understand the pertinent aspects of the human environment within the study area or impacted zone, taken as the area within 5 km from the perimeter of the project site (*Figure 7.10*). Also, a Social Impact Assessment (SIA) study is concurrently being conducted.

7.3.1 Methodology

The aspects of the human environment within the study area include, but are not limited to, the following:

i) Settlement pattern;
ii) Population distribution;
iii) Demography and population dynamics;
iv) Population socio-economic profile; and
v) Existing infrastructure, utilities and amenities.

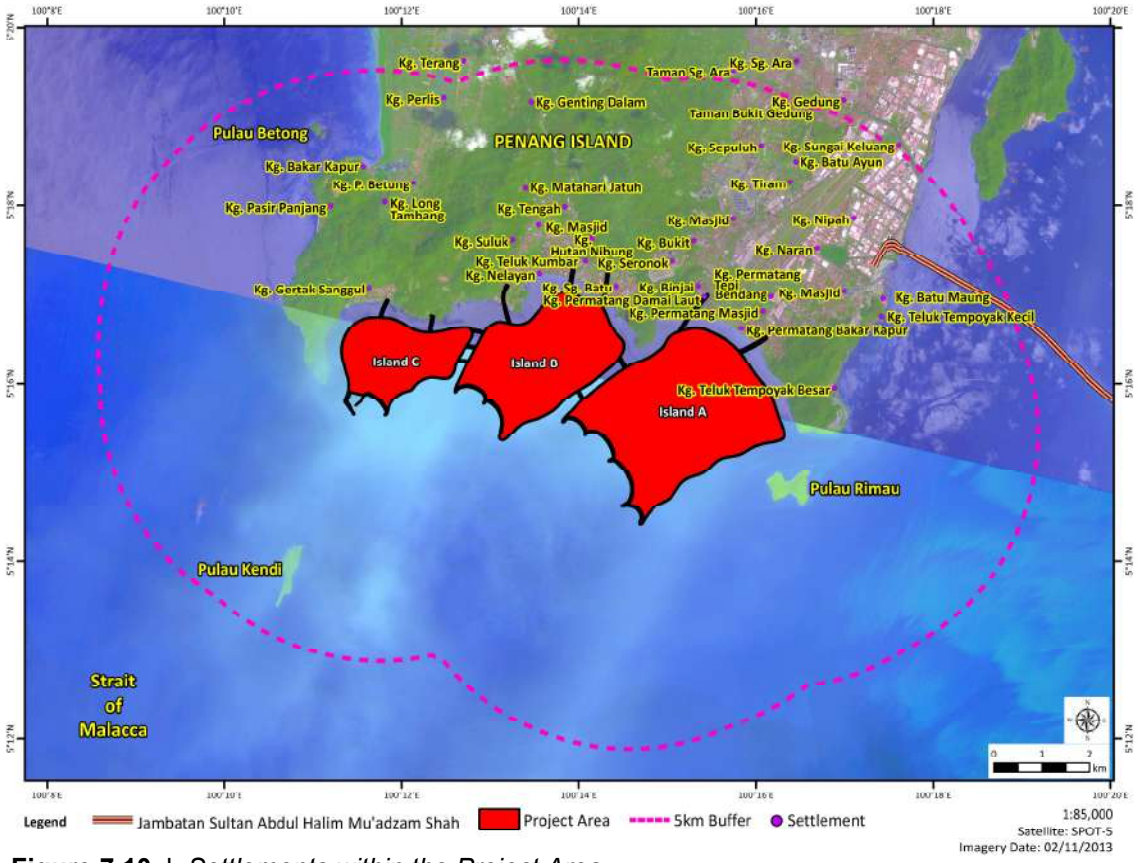


Figure 7.10 I *Settlements within the Project Area*

Any introduction of a new development to an area may bring with it changes. The opinion of the local population hence would have to be brought to the picture and their awareness and perception would have to be gauged. The latter would be filtered from a questionnaire survey that is conducted face to face by enumerators with heads of households based on a random sampling of the affected population both directly, i.e. the fishermen, and the indirectly affected such as the general public. Questionnaire surveys comprising the fishermen and the general public shall be done.

An approximate sample size of 635 shall be selected. The respondents shall mainly comprise the heads of households. Although neighbouring fishing villages within 5 km from the perimeter of the project site are also included, focus shall be given to the most impacted fishing villages.

Apart from the questionnaire survey, public consultation in the form of public meeting or dialogue will also be held. This meeting would involve a cross-section of the local population from different occupational and socio-cultural background. Such a face-to-face meeting shall enable:

i) Further information and clarification be communicated and sought out;
ii) Issues and public concerns to be tabled out and noted for further assessment;
iii) Locals' expectations of the project (be they positive or otherwise) to be expressed; and
iv) Other matters raised to be ironed out via the two-way communication and discussion.

The potential impacts to the environment shall be predicted based on results of existing environmental studies and the effects that the project will impose to the human environment, especially on the local fishermen and gastronomic tourism which the area is popularly known for.

The effects will either be based on outputs from extrapolative or normative methods to predict the impacts, or by the use of expert knowledge.

Impacts on aesthetic value due to the proposed development will also be considered.

The following is the list of the settlements where public consultations will be conducted for the study:

i) Kampung Teluk Tempoyak;
ii) Kampung Permatang Damar Laut;
iii) Kampung Tepi Laut;
iv) Kampung Sungai Tiram;
v) Kampung Gertak Sanggul;
vi) Kampung Sungai Batu;
vii) Teluk Kumbar;
viii) Kampung Bakar Kapur;
ix) Kampung Pulau Betong;
x) Kampung Pasir Beranda;
xi) Kampung Gemuruh;
xii) Kampung Bagan;
xiii) Kampung Nelayan;
xiv) Queensbay Shopping Mall Area;
xv) Business area along the coastline;
xvi) Business area in Bayan Lepas/Bayan Baru;
xvii) Beaches;
xviii) Kampung Binjai;
xix) Kampung Seronok;
xx) Kampung Perlis (Bayan Lepas);
xxi) Kampung Tengah;
xxii) Kampung Masjid;
xxiii) Kampung Bukit;
xxiv) Kampung Nipah;
xxv) Kampung Manggis;
xxvi) Bayan Lepas;
xxvii) Taman Mutiara Perdana;
xxviii) Taman Sri Bayu;
xxix) Taman Tunas Damai;
xxx) Taman Sri Puteri;

xxxi) Taman Desaria Sri Merpati;
xxxii) Apartment Sri Merpati;
xxxiii) Batu Kumbar;
xxxiv) Kampung Permatang Damar Laut/Tepi Laut; and
xxxv) Kampung Teluk Tempoyak.

7.4 Environmental Economic Valuation (EEV)

The main goal of the Environmental Economic Valuation (EEV) is to provide an economic evaluation of the environmental costs and benefits that can be attributable to the project. This is in contrast to the full-blown EEV ordinarily conducted to determine the economic feasibility of the project. It therefore requires the identification and evaluation of the environmental benefits and costs that emanate directly from the physical impacts (whether positive or negative, if any) of the project. By doing so, the findings of the EEV can serve as an important input in the decision-making or approval process of the state or federal authorities.

7.4.1 Methodology

A critical step in the valuation process revolves around the need to ensure valid attribution of impacts on environmental services to the proposed project. In order to satisfy this requirement, physical environmental impacts that can reasonably be attributable to the proposed project must first be demonstrated. In other words, the approach requires the establishment of a clear link between project impacts on the physical functions of the environment and the alteration of the quality and quantity of streams of environmental goods and services. The "Guidelines on the Economic Valuation of the Environmental Impacts for EIA Projects" published by the Department of Environment (2008) will be the guiding document in valuing the environmental impacts.

The valuation process can be divided into nine distinct steps, as follows:

- **Step 1: Identify the project stakeholders. Who has standing?**
  The stakeholders that are affected by the alteration in environmental services are identified in this step.

- **Step 2: Define the "with project" and "without project" scenario**
  A contrast is provided under the "with" and "without" project scenarios, as opposed to "before" and "after" scenarios. It involves the conceptualization of the "with" and "without" project scenarios. For the current project under evaluation, the "with project" scenario is defined as the situation where the project is implemented that entails reclamation works, and the

construction and operation of the proposed commercial and residential development. The “without project” scenario is depicted as the situation in which the proposed project is not implemented i.e. maintenance of the status quo.

- **Step 3: Describe the physical impacts**
  A listing of potential physical impacts of the project that can be reasonably attributed to the project is prepared and described by focusing on the physical extent of the impact and the link between the project and its impact on the flow of environmental services.

- **Step 4: Quantify the impacts on the environment over the duration of the project**
  The physical impacts of the project on the environment is linked and explained in quantitative manner. Quantification of physical impacts is required in order to translate the alteration in environmental services into monetary values. This is achieved through scientific assessments of the study team that include among others marine biologists, air and water quality specialists, and hydraulic specialists.

- **Step 5: Monetize the impacts**
  The physical impacts identified in Step 4 are quantified in monetary terms at this stage. This is attained by using market and non-market valuation techniques. For the purpose of this study, values of similar environmental services obtained in other studies are used as the bases of evaluation. This procedure is commonly known in the literature as the “benefit transfer method”.

- **Step 6: Discounting**
  The streams of costs and benefits are discounted to present values using several discount rates (4%, 6% and 8%).

- **Step 7: Determine the Net Present Value**
  The net present value is computed in this step by adding up the discounted values of the losses and gains in environmental services.

- **Step 8: Perform sensitivity analysis**
  Sensitivity test is conducted for different discount rates to demonstrate the impact of variation in rates on the net present value of the environmental costs and benefits.

- **Step 9: Make a recommendation**
  An overall assessment is made based on the magnitude of Net Present Values at different levels of discount rates.

For the purpose of the EEV, the "with project" scenario is defined as the scenario where the islands are reclaimed and subsequent development is completed. "without project" scenario is considered as the situation in which the proposed project is not implemented i.e. the status quo is maintained.

7.4.2 Project Option

For the purpose of the EEV, the "with project" scenario is defined as the scenario where the islands are reclaimed and subsequent development is completed. "without project" scenario is considered as the situation in which the proposed project is not implemented i.e. the status quo is maintained.

7.4.3 Identification of Incremental Costs and Benefits

Conforming to standard professional practice, only incremental costs and benefits will be considered. Considering only "incremental costs and benefits" means only marginal costs and benefits that arise as a result of choosing the "with project" option (instead of "without project") is included in the study.

Benefits can be defined as goods and services that contribute towards the attainment of society's goals. Costs, on the other hand, are losses in terms of goods and services that could have been employed to achieve the goals of society. Both costs and benefits can be broken down further into tangible/intangible and primary/secondary categories.

7.4.4 Estimation of Monetary Values

Generally, the productivity approach will be used to determine unit costs and benefits. The method stipulates that the cost or benefit of the proposed project is to be evaluated by quantifying the productivity loss or gain that arises directly from physical degradation or improvement of the environment. It may be necessary at this stage to use the benefit transfer approach in cases where appropriate prices are not available for quantification. The methodologies to estimate monetary values will be based on the Guidelines on the Economic Valuation of the Environmental Impacts for EIA Projects.

7.4.5 Overall Cost/Benefit Evaluation

The overall cost and benefit assessment is done by combining the cost and benefit streams in the analysis over the project life. The environmental economic performance indicators such as the Net Present Value (NPV) will be determined along with some qualitative assessment of non-quantifiable benefits and costs. A sensitivity test for different levels of discount rate will also be conducted.

08 Potential Significant Impacts and Mitigation Measures

8.1 Introduction

The potential impacts will be in agreement with the zone of impact (ZOI), which is categorized into the following:

i) Physical environment: the ZOI is limited within the 5-km radius;
ii) Biological environment: the ZOI extend shall be determined by the hydraulic study or limited to a 5-km radius;
iii) Human environment: the ZOI is limited within the 5-km radius;
iv) Sedimentation and erosion: the ZOI extent shall be determined by the hydraulic study; and
v) Environmental Sensitive Areas (ESAs): the ZOI extend shall be determined by the hydraulic study.

Table 8.1 lists the environmental components to be assessed.

Table 8.1 I *Environmental Components*

Environmental Components	Details
Physical	▪ Current flow ▪ Wave condition ▪ Sediment transport ▪ Coastal morphology ▪ Climate and meteorology ▪ Geology and geotechnical ▪ Hydrology and drainage ▪ Water quality ▪ Sediment quality ▪ Air quality ▪ Noise ▪ Marine traffic and navigation ▪ Land traffic ▪ Land use
Biological	▪ Terrestrial components: mangroves, birds, mammals and other wildlife, insects and other aquatic fauna. ▪ Marine biological components: macrobenthos, phytoplankton, zooplankton and fisheries communities.
Human Environment	The study area or the zone of impact will specifically cover the area within the 5-km radius from the boundary of the project area.
Environmentally Sensitive Areas (ESAs)	▪ Forest reserve: Bukit Genting Forest Reserve, Bukit Gemuruh Forest Reserve and Pasir Panjang Forest Reserve ▪ Turtle landing: Teluk Kumbar Beach, Sungai Batu and Pulau Rimau. ▪ Seaweed: Tanjung Masari, Tanjung Gertak Sanggul and Teluk Pasir Belanda. ▪ Fisherman Villages: Kampung Batu Maung, Kampung Teluk Tempoyak Kecil, Kampung Teluk Tempoyak Besar, Kampung Permatang Damar Laut, Kampung Sungai Batu, Kampung Nelayan, Kampung Gertak Sanggul and Kampung Pulau Betung. ▪ Islands: Pulau Rimau, Pulau Kendi and Pulau Betung. ▪ Aquacultures: Kampung Perlis Zone,Sungai Pulau Betung, Pulau Kendi Zone, Pulau Rimau Zone, Kampung Teluk Tempoyak Kecil

8.2 Key Environmental Issues

The study shall predict and assess the impacts of the project on the environmental components based on the major key environmental issues that will be the main concern to the implementation of the proposed development that include the following:

i) Erosion and Sedimentation
The erosion and sedimentation rates will be expected to change upon completion of the proposed project.

ii) Sediment Plume Dispersion due to Reclamation/ Dredging Work
All reclamation and dredging activities will create some form of sediment plume in the water column.

iii) Socio-economic: Fishermen
Reclamation would have direct socio-economic impacts towards the locals, particularly the fishermen who ply and toil the area. They must divert their routine routes once the reclamation and dredging activities start and thus incur additional cost and time.

iv) Socio-economic: Differences in Culture and Social Life
The better-off elites would be among the interested buyers of the properties on the reclaimed land. The existing medium-income locals within the area would be facing socio-economic impacts, either good or otherwise.

v) Marine Traffic and Navigation Safety
Marine traffic congestion will occur when marine vessels enter the reclamation area. There will be competing marine traffic plying the area, which may increase the risk of collision and creating some impact on the safety of fishermen and mariners within the project area.

vi) Marine Ecology
The aquatic habitat within the reclamation area might be impacted. There are claims that there are seagrass and coral reefs around Pulau Rimau and Pulau Kendi area. The biological baseline data will determine the status of marine ecology of these areas; and the severity of potential impacts will be analyzed.

vii) Land Traffic: Traffic Dispersion from Island
The proposed development will increase the existing land traffic. There will be an influx of vehicles using the existing road to the proposed development which would eventually create new traffic volume internally. Negative impact would occur if the traffic dispersal is not well-catered and mitigated.

8.3 Methodology of Impact Prediction

The evaluation of impacts will be made against established standards and criteria as required under the Environmental Quality Act 1974 (Amendment 2012) and its subsidiary legislation. The Environmental Quality Act or its subsidiary legislation will be based on the values set by the Department of Environment (DOE) or such other criteria generally accepted by this department. The prediction methodology in addressing the impacts is as summarized in *Table 8.2.*

Table 8.2 I *Methodology of Impacts Prediction*

Impact	Prediction Method
Coastal Erosion and Sediment Transport	▪ Hydrodynamic models for erosion/accretion ▪ Sediment transport model ▪ Wave refraction analysis
Water Quality	Comparisons with Malaysian Marine Water Quality Criteria and Standard (MWQCS).
Surface Water	Hydrological Procedures for urban and rural settings by JPS. Also, other models for storage, routing, watershed analysis, flood plain hydraulic and urban hydrology development for local or tropical conditions and MASMA.
Flora and Fauna	▪ Species impacted by the project based on IUCN Guidelines and conservation status of mammals, birds, herpetofauna, invertebrates, fisheries, benthos, plankton and corals. ▪ Habitat. ▪ Studies include marine and brackish ecosystems.
Air	Comparison with Recommended Malaysian Air Quality Guidelines (RMAQG).
Noise	Comparison with DOE's "The Planning Guidelines for Environmental Noise Limits & Control".
Human Environment	▪ EEV. ▪ Socioeconomic impact - perception study using questionnaires and public dialogue.
Geology and geotechnics/ Hydrogeology	▪ Observation or analysis through reports, field measurements and laboratory investigations.

8.4 Mitigation and Abatement Measures

The assessment of various sectors (physical, biological, human environment, etc.), the study will proceed to recognize the impacts and propose the proper mitigation measures to be taken. The possible impacted components shall be assessed by the project activities *(Table 8.3).*

Table 8.3 | *Possible Impacted Components by Project Activities*

Project Activities		Possible Impacted Components
Pre-construction	Selection of reclamation method	None
During construction	▪ Dredging of temporary access channel	▪ Coastal erosion and sediment transport ▪ Water quality ▪ Flora and fauna ▪ Noise ▪ Human environment
	▪ Installation of silt curtain	▪ Water quality ▪ Flora and fauna ▪ Sediment transport ▪ Human environment
	▪ Construction of perimeter bund	▪ Water quality ▪ Flora and fauna ▪ Sediment transport ▪ Human environment
	▪ Placement of fill material at the reclamation area	▪ Coastal erosion and sediment transport ▪ Water quality ▪ Flora and fauna ▪ Noise ▪ Human environment
	▪ Treatment of fill material	▪ Water quality ▪ Flora and fauna
	▪ Dredging of flushing channel and between reclaimed islands	▪ Coastal erosion and sediment transport ▪ Water quality ▪ Flora and fauna ▪ Noise ▪ Human environment
	▪ Construction of island edge protection structures	▪ Coastal erosion and sediment transport ▪ Water quality ▪ Flora and fauna ▪ Noise ▪ Human environment
Operational Phase		▪ Coastal erosion and sediment transport ▪ Water quality ▪ Flora and fauna ▪ Air ▪ Noise ▪ Human environment

Mitigation measures are defined as the elimination, reduction or control of the adverse environmental potential impacts caused by the proposed project to ensure these impacts will be within acceptable levels. The mitigation measures will be addressed based on the different stages which are pre-construction, reclamation, dredging and post-reclamation. In order to discuss the impacts and mitigation measures, the areas to be studied according to the project stages are as summarized in *Table 8.4*.

Table 8.4 I *Study Areas in Identifying Mitigation Measures*

Project Activities		Areas to be Studied
Pre-construction	Selection of reclamation method	None
During construction	▪ Dredging of temporary access channel	▪ Water quality ▪ Marine traffic and navigation study ▪ Benthic community ▪ Sediment dispersion ▪ Noise control
	▪ Installation of silt curtain	▪ Water quality ▪ Marine traffic and navigation study ▪ Sediment dispersion
	▪ Construction of perimeter bund	▪ Water quality ▪ Marine traffic and navigation study ▪ Sediment dispersion
	▪ Placement of fill material at the reclamation area	▪ Water quality ▪ Marine traffic and navigation study ▪ Sediment dispersion ▪ Noise control
	▪ Treatment of fill material	▪ Sediment dispersion ▪ Noise control
	▪ Dredging of flushing channel and between reclaimed islands	▪ Water quality ▪ Marine traffic and navigation study ▪ Benthic community ▪ Sediment dispersion ▪ Noise control
	▪ Construction of island edge protection structures	▪ Water quality ▪ Marine traffic and navigation study ▪ Benthic community ▪ Sediment dispersion ▪ Noise control
Operational phase		▪ Hydrodynamic (water levels and flooding impacts) ▪ Waves ▪ Sedimentation and erosion ▪ Water quality ▪ Noise ▪ Marine traffic ▪ Traffic dispersal ▪ Socio-economy

09 Residual Impacts

Residual impacts are defined as environmental impacts that are predicted to remain even after the implementation of mitigation measures. All residual impacts (if any) will be notified and alternatives to manage these impacts shall also be proposed accordingly. This is to ensure maximum beneficial environmental effect and that all residual impacts are within the statutory and non-statutory permissible levels. It can be envisaged that the residual impacts would be as follows:

i) Degradation of marine water quality;
ii) Erosion and sedimentation;
iii) Noise from the Bayan Lepas airport extension;
iv) Increasing marine traffic;
v) Increasing land traffic;
vi) Changes in viewscape; and
vii) Impacts on socio-economy.

10 Environmental Management Plan

An Environmental Management Plan (EMP) is a project-specific plan developed to ensure that appropriate environmental management practices are followed during the construction and operation of the proposed project. An outline of the general framework of an Environmental Management Plan (EMP) will be explained in this chapter. The plan will map out the significant environmental issues, and identify the command-and-control framework which envelops the following major components:

i) Environmental Monitoring Programme;
ii) Emergency Response Plan;
iii) Environmental Audit; and
iv) Abandonment Plan.

10.1 Environmental Monitoring Programme

Environmental monitoring is a fundamental programme to ensure that the project activities do not pose any impacts towards the existing environment. The monitoring programme will assist in detecting the development of any unwanted environmental impacts and provides opportunities for adopting appropriate mitigating measures. It also defines the monitoring mechanism, identifies monitoring parameters and evaluates the performance and effectiveness of the mitigation measures proposed in the

EMP and to suggest improvements. The components of environment that will be monitored are:

i) Water quality;
ii) Sediment quality;
iii) Air quality;
iv) Noise; and
v) Bathymetric survey.

Table 10.1 summarizes the proposed environmental monitoring programme.

Table 10.1 | *Proposed Environmental Monitoring Programme*

Item	Parameter	Monitoring Stations	Sampling Frequency	Environmental Quality Criteria	Reporting Requirement
Water quality	Temperature, Salinity, pH, Conductivity, Turbidity, DO, BOD,TOC, TSS, and Oil and Grease, AN, Phosphate, Nitrate, Heavy Metals, Faecal Coliform, *E.coli*	As per *Table 7.1,* in *Chapter 7*	Weekly	Results will be compared with the baseline and Malaysia Marine Water Quality Criteria and Standard (MWQCS).	Report to be submitted to DOE monthly and quarterly.
Sediment quality	Zinc, Nickel, Copper, Chromium, Lead, Arsenic, Cadmium.	As per *Table 7.4*, in *Chapter 7*	Quarterly	Results will be compared with the baseline and US EPA Standard.	Report to be submitted to DOE quarterly
Air quality	TSP, PM_{10}, $PM_{2.5}$, SO_2, NO_2	As per *Table 7.7*, in *Chapter 7*	Quarterly	Results will be compared with the baseline and Recommended Malaysian Air Quality Guidelines (RMAQG).	Report to be submitted to DOE quarterly.
Noise	L_{min}, L_{max}, L_{10}, L_{50}, L_{90}, L_{eq} (24 hours profile)	As per *Table 7.11*, in *Chapter 7*	Quarterly	Results will be compared with the baseline and DOE's "The Planning Guidelines for Environmental Noise Limits and Control".	Report to be submitted to DOE quarterly.
Environmental Audits	To audit the compliances with the DEIA approval conditions and the relevant environmental regulations and guidelines.	The whole project's implementation and its activities.	Quarterly	Environmental Audits should be carried out by a third party Environmental Auditor (registered with DOE).	Report to be submitted to DOE quarterly.
Bathymetric Survey	Near shore and bed level change	-	▪ Once every three (3) months during the construction phase ▪ Once every six (6) months during the post construction phase	Results will be compared to the baseline condition.	Report to be submitted to DID not later than three (3) months after the completion of each survey.

10.2 Emergency Response Plan (ERP)

The ERP establishes an organizational structure, outline actions and procedures and identifies available resources to enable the Developer and Emergency Services to manage an emergency by providing an effective and safe response. The preparation of ERP is carried out in accordance with the Occupational Safety and Health Act (1994). The objectives of ERP are:

i) To preserve life and ensure the safety of people;
ii) To minimize the impact on the environment;
iii) To minimize damage to property;
iv) To minimize the impact on business continuity and reputations; and
v) To minimize the impact on the neighbouring industry and community.

The safety plan will be prepared particularly for the vessels involved due to the nature of the project's activities which will be carried out at sea. The plan will provide a layout of the vessel, and the location of all safety appliances (e.g. firefighting equipment, life rafts, life jackets and first-aid boxes) on board the vessel. An explanatory list with codes used for all the existing appliances will be part of the safety plan.

10.3 Environmental Audit

According to the Environmental Quality Act 1974 (Amendment 2012), environmental audit means a periodic, systematic, documented and objective evaluation to determine the compliance status with regards to environmental regulatory requirements, the environmental management system and the overall environmental risk of the premises. An effective corporate environmental auditing programme increases environmental management effectiveness and comfort with the knowledge that the risks of potential exposure to adverse environmental issues are being addressed.

10.4 Abandonment Plan

As required by the DOE EIA Guidelines, abandonment of the proposed Project will need to be evaluated in the Second Schedule EIA report. This will cover:

i) Equipment and facilities that will be removed when the Project is terminated, abandoned temporarily or permanently, how they will be removed, how the area will be reclaimed and/or established;
ii) The ultimate disposal of materials which are stabilized during the reclamation and post-reclamation phase; and
iii) Plan to ensure minimum damage to the environment as a result of the abandonment.

Attachment 1

Responses to Comments during TOR Panel Review Meeting on 6th April 2016

Terms of Reference (TOR) for the Environmental Impact Assessment (EIA) (Second Schedule) for the Proposed Reclamation and Dredging Works for the South Reclamation Scheme (SRS), Penang

Response to Comments during TOR Panel Review Meeting on 6th April 2016

A TOR Panel Review Meeting for the Proposed Reclamation and Dredging Works for the South Reclamation Scheme (SRS), Penang was conducted on the 6th of April 2016 at the Department of Environment (DOE) Headquarters, Putrajaya. Various relevant agencies and parties involved have attended the meeting. This document is prepared in response to the comments *(Appendix A)* made by the following:

Panel of Experts:

1) En. Nor Razaman Hamzah;
2) Prof. Madya Dr. Tan Shau Hwai; and
3) Puan Yasmin Rashid.

Agencies:

1) Department of Environment (DOE);
2) Department of Town and Country Planning (JPBD);
3) Economic Plan Unit (UPEN);
4) Department of Irrigation and Drainage (DID);
5) Department of Fisheries (DOF);
6) Majlis Bandaraya Pulau Pinang (MBPP);
7) Penang Port Commission (PPC);
8) Marine Department (JLM);
9) Health Department Pulau Pinang; and
10) Ministry of Natural Resources and Environment (BPASPI NRE).

It should be noted that the Project name has been changed to the ***"Proposed Reclamation and Dredging Works for the Penang South Reclamation (PSR), Penang"*** for the revised TOR submission.

Table 1 | *Comments from Panel's Expert*

No.	Comments	Reviewer Panel	Response
1.	The proposed reclamation project concept and its top-side development must be in line with the National Physical Plan 2 (NPP2) and the National Coastal Zone Physical Plan (RFZPPN) under Department of Town and Country Planning (JPBD) and the Ministry of Urban Wellbeing, Housing and Local Government (KPKT) as the followings:	DOE	The proposed reclamation project concept and its top-side development has been referred to the NPP2 and RFZPPN as stated in the TOR in *Chapter 2 – 2.1.3.2 National Physical Plan 2 (Table 2.2)* and *2.1.3.3 National Coastal Zone Physical Plan (RFZPPN) (Table 2.3)* as below:
	a) Coastal reclamation shall not be encouraged except for the development of ports of strategic national importance.		The proposed reclamation is currently being referred to the National Physical Planning Council (NPPC).
	b) Coastal reclamation shall not be permitted in or adjacent to sensitive ecosystems such as marine parks, mangroves, mudflats, coral reefs, seagrass beds, turtle landing sites and major tourism beaches.		All measures outlined in the National Coastal Zone Physical Plan (RFZPPN) will be adhered to.
	c) It is important to control erosion or for the purpose of beach nourishment.		Erosion and other potential coastal impacts shall be assessed in the hydraulic study. Shoreline protection measures required to minimize erosion will also be determined.
	d) It shall not affect the natural processes of the coastal hydrology regime.		Impacts on the natural processes of coastal hydrology regime shall be assessed in the hydraulic study.
	e) The economic and social benefits of the coastal reclamation are much higher than its environment and social costs.		Both the economic and social benefit of the proposed PSR development shall be assessed in the EIA study.
	f) It shall not affect the stability of the adjacent project site including the coastal zone.		Impacts on the stability of the adjacent project site shall be assessed in the hydraulic study.
	g) All proposed coastal reclamation must be referred to the Council of the National Physical Planner.		The proposed reclamation is currently being referred to the National Physical Planning Council (NPPC).
	h) All coastal reclamation works with an area of more than 50 hectares should obtain an EIA approval.		The TOR document is a pre-requisite for the EIA study which shall be submitted to DOE for approval.

No.	Comments	Reviewer Panel	Response
2.	The proposed islands reclamation and its top-side development must be in line with the Penang Structure Plan (RSNPP) and Local Plan (RT). They must be referred to and stated clearly in the EIA report.	DOE	The Penang Structure Plan has been referred to as indicated in *Chapter 2 – 2.1.3.4 Penang Structure Plan 2020 (RSNPP)*. At the time of this writing, the Project Proponent is working closely with the JPBD Penang to incorporate the proposed project in the RSNPP.
3.	In *Chapter 3 - Item 3.5 (page 3-5)* mentioned that the development is meant to provide new affordable housing in Penang Island, however, in *Figure 4.6 (Land Use of the Proposed Reclaimed Islands)*, the area reserved for affordable housing is only 357 acres. Explain the distribution of the affordable housing in percentage and relate it with relevant government policies.		The total affordable housing is currently at 26.5% of the total housing (excluding affordable). There is no current policy by the Penang State Government which tells exactly the requirement for affordable housing. However, there is a requirement that housing can be developed only at maximum of 120 units per acre (UPA) for affordable housing scheme. Current affordable housing in PSR is 77 UPA.
4.	In *Chapter 3 - Item 3.7 (page 3-7)* stated the benefits for fishermen. Explain this in detail and its relevance with the National Physical Plan requirements.		The Project shall include benefits for the fishermen such as maintaining the access to sea with wide channels and deep waterways; as well as further improving their existing facilities. The development is expected to expose the fishermen to other job opportunities in tourism, recreational fishing, aquaculture and restaurants.
5.	The Project Concept must be in line with NPP2, RFZPPN, RSNPP and RT of the Project area.		The Project Concept has taken NPP2, RFZPPN, RSNPP and RT into consideration as mentioned in the TOR *Chapter 2: 2.1.3 Legal Requirements.*
6.	The Project Components must include complete elaboration of the impact assessment and mitigating measures such as:		The Project Components will include complete elaboration of the impact assessment and mitigating measures in the EIA report.
	i. Reclamation of Island A, B and C: a) The selection of reclamation layout or landform and breakwater structure must be based on several options that have been assessed using hydraulic modeling and is proven to give the least impact to		Feasibility studies assessed various areas along Penang Island's coastline – south, west, north and east. These studies indicated the south coast as being suitable for reclamation due to it being a natural bay with slow currents. After

No.	Comments	Reviewer Panel	Response
	the environment, socio-economy and navigation.	DOE	selecting an appropriate site, the present reclamation layout or landform was based on the study of various options using hydraulic modeling to give the least impact to the environment, socio-economy and navigation as shown in *Chapter 5 – 5.2 Layout Options.*
	a) The EIA study must include sand sourcing and disposal areas and the transportation of fill material and dredged waste.		Sand sourcing and disposal areas and the transportation route of fill material and dredged waste shall be indicated in the EIA report.
	b) The proposed Project method statement chosen must consider the most minimal impact to the environment based on several options.		The proposed Project method statement chosen shall consider the most minimal impact to the environment based on several options and addressed in the EIA report.
6.	c) The criteria of the fill material (sand source) must be stated clearly in terms of quantity and quality such as type of sand and silt content in percentage to ensure minimal plume impacts to the marine ecosystem near the reclamation site.		The criteria of the fill material or sand source shall be included in the EIA report.
	d) The sand source location or concession holder must be stated so that the route of transportation to the sand source from the reclamation site can be identified.		The sand source location or concession holder shall be stated in the EIA report.
	ii. Top-side development on Island A, B and C:		
	a) Explain clearly the development components identified as “mixed-use” on the reclaimed islands.		The proposed mixed-use on the reclaimed islands consist of approximately 90% residential and 10% commercial to encourage live, play and work concept.
	b) To state the type of industry that will be placed on the reclaimed islands.		There will be no heavy industry. Encouraged industries to be developed on the reclaimed islands are related to green, high technology and research based.

No.	Comments	Reviewer Panel	Response
6.	c) To state the expansion capacity of aerodromes on the reclaimed islands (would require a separate EIA if it is more than 1000 m).	DOE	There is no airport runway extension towards the reclaimed islands.
7.	Detailed explanation and elaboration on the proposed Project location which covers the followings:		
	a) Clear and detailed latest land use map showing 5-km radius with 250 m interval; indicating all Environmentally Sensitive Areas (ESAs) and environmental sensitive receptors in A3.		Clear and detailed latest land use map showing 5-km radius with 250 m interval; indicating all Environmentally Sensitive Areas (ESAs) and environmental sensitive receptors in A3 is included in *Chapter 6 – Figure 6.9*.
	b) A map indicating the distance of the ESAs from the proposed Project location within the 5-km radius.		A map indicating the distance of the ESAs from the proposed Project location within the 5-km radius is shown in *Chapter 6 – Figure 6.12* and *Table 6.1*.
	c) All maps and figured shown must be the latest and clearly marked with relevant legends.		All maps and figures shown are taken from SPOT5 satellite image and are clearly marked with relevant legends.
	d) Maps shown must include their legit sources.		All maps shown have included their legit sources.
8.	Detailed descriptions on the existing environment as well as sampling and monitoring stations must be included.		Detailed descriptions on the existing environment are included in *Chapter 6 – 6.2 General Site Description;* while sampling and monitoring stations are included in *Chapter 7: Approach and Methodology*.
9.	There are several rivers surrounding the Project area. However, there is no statement saying that there will be a study conducted to assess backflow and flood issues.		The changes in water levels at the river outlets shall be compared between 'with project' and 'without project' conditions in assessing possible backflow from the reclamation of the islands. The findings shall be included in the EIA report.

No.	Comments	Reviewer Panel	Response
10.	The TOR document must be updated with the inclusion of the following studies:	DOE	
	a) Marine traffic and navigation studies.		Marine traffic and navigation study shall be addressed as mentioned in *Chapter 7 – 7.1.7 Marine Traffic and Navigation*.
	b) Soil investigation and Traffic Impact Assessment (TIA).		Soil investigation and Traffic Impact Assessment (TIA) shall be addressed as mentioned in *Chapter 7 – 7.1.6 Soil Characteristics* and *7.1.8 Land Traffic* respectively.
11.	The following potential impacts need to studied comprehensively:		
	a) Impacts on Hydraulic - Hydraulic study should be conducted to determine possible erosion and accretion around the proposed Project area which includes the nearby coastline, possible flooding at the river mouth, changes in water quality in case there is no flushing within the reclamation site etc. The results of the hydraulic study and their detailed explanation must be submitted to Department of Irrigation and Drainage (DID).		The hydraulic study shall determine possible erosion and accretion around the proposed Project area which includes the nearby coastline, possible flooding at the river mouth, changes in flushing capacities within the reclamation site etc. The results of the hydraulic study and their detailed explanation shall be submitted to Department of Irrigation and Drainage (DID) and incorporated in the EIA report.
	b) Impacts on ESAs and Marine Ecology - ESAs such as seagrass, mangroves, National Park, coral reefs, intertidal mudflats, marine and terrestrial habitat, turtle landing etc must be considered.		ESAs such as seagrass, mangroves, National Park, coral reefs, intertidal mudflats, marine and terrestrial habitat, turtle landing etc shall be considered and incorporated in the EIA report.

No.	Comments	Reviewer Panel	Response
11.	c) Impacts on Water Quality - The sewage discharge limit must comply with the Environmental Quality (Sewage) Regulation (2009). - The water quality study must show the effluent source including flow rate, loading etc. - Marine water quality modeling conducted must show clearly the impacts of sewage discharge into the sea and compared with the Malaysian Marine Water Quality Criteria Standards (MWQCS). - The location of the effluent discharge point must be shown and marked clearly. - The sediment plume dispersion from the reclamation activity must be shown to assess the impacts on marine ecology.	DOE	This TOR document addresses the scope of study in assessing the impacts from reclamation and dredging activities only. Therefore, the impacts from the top-side development (e.g. sewage discharge) shall not be addressed in this EIA report. Sewage discharge from reclamation activity, dredging activity and topside development will adhere to requirements needed to maintain the surrounding's water quality. Sediment plume dispersion from the reclamation and dredging activities shall be shown in assessing the impacts to the marine ecology in the EIA report.
	d) Impacts on Marine Navigation and Safety - Predicted impacts on marine navigation and safety must be conducted through navigation simulation.		A study on marine traffic and navigation shall be conducted in the EIA study. However, navigation simulation shall only be conducted once the reclaimed islands are ready.
	e) Impacts on Noise - Noise assessment must be conducted and based on The Planning Guidelines for Environmental Noise Limits and Control.		Noise assessment shall be conducted and based on The Planning Guidelines for Environmental Noise Limits and Control. The results will be included in the EIA report.
	f) Solid Waste and Scheduled Waste Management - Solid waste management must comply with Solid Waste and Public Cleaning Management Act 2007. - Scheduled waste management must comply with Environmental Quality (Scheduled Wastes) Regulations 2005.		Solid waste management proposed shall comply with Solid Waste and Public Cleaning Management Act 2007. Scheduled waste management shall comply with Environmental Quality (Scheduled Wastes) Regulations 2005. Both items shall be included in the EIA report.

No.	Comments	Reviewer Panel	Response
11.	g) Socio-economy - The socio-economy study must look into the fishing industry, tourism industry and local economy development using survey data, secondary data, and Focus Group Discussion (FGD) and public meetings with relevant stakeholders.	DOE	The socio-economy study shall look into the fishing industry, tourism industry and local economy development using survey data, secondary data, and Focus Group Discussion (FGD) and public meetings with relevant stakeholders. The findings from the study shall be included in the EIA report.
	h) Economic Valuation of the Environmental Impacts - The Economic Valuation of the Environmental Impacts must be conducted in detail and monetized following the Guidelines on the Economic Valuation of the Environmental Impacts for EIA Projects.		The Economic Valuation of the Environmental Impacts shall be conducted in detail and monetized following the Guidelines on the Economic Valuation of the Environmental Impacts for EIA Projects. The findings and conclusion shall be included in the EIA report.
12.	The EIA study must propose effective measures to address the potential impacts:		
	a) All measures stated in the EIA report must be project specific. b) Commitment from the Project Proponent to adopt effective mitigating measures during reclamation and dredging works that can minimize the negative impacts to the surrounding environment. c) Sewage system must be explained specifically in terms of design, efficiency and type. Discharge limits and standards according to the design and specification must be stated.		a) All measures stated in the EIA report shall be project specific. b) The EIA report shall be a binding document in which the Project Proponent agrees to commit to adopt most suitable and feasible mitigating measures during reclamation and dredging works that can minimize the negative impacts to the surrounding environment. c) Sewage discharge from reclamation activity, dredging activity and topside development will adhere to requirements needed to maintain water quality.
13.	Abandonment plan must be explained in case the Project fails to be completed at each stage (e.g.: reclamation stage, construction stage, operational stage).		Abandonment plan shall be explained in case the Project fails to be completed at each stage (e.g.: reclamation stage, construction stage, operational stage) in the EIA report.

No.	Comments	Reviewer Panel	Response
14.	An Emergency Response Plan (ERP) for oil spill, vessel collision, fire, explosion etc must be stated for each Project stage.	DOE	An Emergency Response Plan (ERP) for oil spill, vessel collision, fire, explosion etc shall be stated for each Project stage in the EIA report.
15.	The methodology for each study must be explained clearly in the TOR.		The methodology for each study is explained in the TOR in *Chapter 7: Approach and Methodology*.
16.	Information and data used in the EIA study must be of current data.		All information and data used in the EIA study shall be taken from primary and current data.
17.	The location of baseline sampling stations for all parameters to be studied must be shown clearly in the map.		The location of baseline sampling stations for all parameters to be studied is shown clearly in the map as included in *Chapter 7: Approach and Methodology.*
18.	Relevant guidelines followed must be the latest published by DOE and other authorities.		Relevant guidelines followed are from the latest published by DOE and other authorities as listed in *Chapter 2 – 2.2 EIA Study Approach*.
19.	Project Implementation Schedule must be included.		The Project Implementation Schedule has been included in *Chapter 4 – 4.7 Project Phasing and Schedule*.
20.	Public consultations must be conducted with the fishermen association and aqua farmers.	Dr. Zainab Zubir	Public consultations have been conducted with the fishermen association and aqua farmers.
21.	Proposed mitigating measures concerning the key environmental issues as stated in Page 8-3 item (iii) and (iv) must be identified and addressed during public consultations.		Mitigating measures concerning the key environmental issues as stated in Page 8-3 item (iii) and (iv) shall be identified and proposed in the EIA report.
22.	The outcome from the public consultations must be taken into consideration and reported in the Environmental Impact Assessment (EIA) to overcome the issues of objections from the public, fishermen and aqua farmers.		The outcome from the public consultations will be taken into consideration and included in the EIA report under the study of human environment in its own chapter.
23.	Possible residual impacts and socio-economic study must be addressed clearly in the EIA report.		Possible residual impacts and socio-economic study shall be addressed clearly in the EIA report in their own respective chapters.

No.	Comments	Reviewer Panel	Response
24.	The effects from land reclamation activities depend on the size, characteristics and sensitivity of the areas and techniques applied. The following potential key environmental issues should be addressed: - Increase in water column turbidity - Release of contaminants from dredged material - Damage to terrestrial vegetation - Threatened and migratory species - Introduced marine species - Hydrocarbon spillage - Noise, dust and safety	Pulau Pinang Health Department	The following potential key environmental issues shall be addressed in the EIA report: - Increase in water column turbidity - Release of contaminants from dredged material - Damage to terrestrial vegetation - Threatened and migratory species - Introduced marine species - Hydrocarbon spillage - Noise, dust and safety
25.	The EIA study needs to incorporate the estimation of the total loss of marine biodiversity.	DOF	The estimation of the total loss of marine biodiversity shall be incorporated in the EIA report under the study of marine flora and fauna.
26.	The EIA study must consider the locations of the existing artificial reefs within the project area as well as to propose other suitable locations for the reefs.		The locations of the existing artificial reefs within the project area shall be identified and included in the EIA report under the study of marine flora and fauna.
27.	To assess if there are restrictions for the fishermen to fish once the islands are reclaimed.		The assessment of whether there will be restrictions for the fishermen to fish once the islands are reclaimed shall be included in the EIA report.
28.	The importance of aquaculture activities especially shrimp hatcheries at Teluk Kumbar and Gertak Sanggul should be addressed.		The importance of aquaculture activities at Teluk Kumbar and Gertak Sanggul shall be addressed in the EIA report.
29.	The effects of changes in the current speed on TSS concentration and DO with concern to the cage cultures in Batu Maung, Pulau Jerejak and Sungai Udang must be addressed.		Changes in current speed and their effects on TSS concentration and DO shall be assessed for the project area and surrounding.
30.	The long term impacts on the cage cultures from the reclamation process must be addressed.		The long term impacts on the cage cultures from the reclamation process shall be addressed in the EIA report.

No.	Comments	Reviewer Panel	Response
31.	To propose a fishing boat navigation channel once the islands are fully reclaimed.	DOF	The reclamation adopts an island concept, which reduces coastline impacts and facilitates sea access for fishermen. Dredged waterways will further improve fishermen's access to sea.
32.	To state the actual area of the reclamation site and the nearest distance to the Pulau Pinang and Perak water boundary.		The actual area of the reclamation site is 4,500 acres. The distance from the site to Pulau Pinang and Perak water boundary is 16.3 km and shown in *Appendix 2*.
33.	Long term impacts on the cage culture operators throughout the reclamation activity must be addressed.		The long term impacts on the cage culture operators throughout the reclamation activity shall be addressed in the EIA report.
34.	To propose alternative source of income for fishermen with sampan and boats with small engines.		Alternative source of income for fishermen with sampan and boats with small engines shall be explored and proposed as mitigating measures in the EIA report.
35.	According to the DSU 8 included in the RSNPP 2020: "*Tebusguna tanah sebagai alternatif penyediaan kawasan pembangunan baru akan dihadkan di kawasan yang telah dikenalpasti*" The reclamation site has been identified to be gazetted for the expansion of the airport. However, the area of the proposed project is bigger than the one included in the RSNPP 2020; therefore, this project has been included in the *Kajian Semula Rancangan Struktur Negeri Pulau Pinang*.	JPBD Pulau Pinang	This statement is noted.
36.	The disposal ground and sand source area for the reclamation and dredging works should be identified.	DOE	The potential disposal ground and sand source area are shown in *Chapter 4 – Figure 4.7*. The locations shall be confirmed in the EIA report.
37.	The transportation of materials and workers from the sand/rock sources should be identified.		The transportation routes for materials and workers from the sand/rock sources shall be identified and shown in the TOR - *Chapter 4: Project Descriptions (Figure 4.7)* and EIA report.

<table>
<tr><th>No.</th><th>Comments</th><th>Reviewer Panel</th><th>Response</th></tr>
<tr><td>38.</td><td>The location of the worker base camps and its waste management should be identified.</td><td rowspan="6">DOE</td><td>The location of the worker base camps and its waste management shall be identified and indicated in the EIA report.</td></tr>
<tr><td>39.</td><td>The viability of the fishermen after the islands are fully reclaimed should be assessed.</td><td>The fishermen’s viability after the islands are fully reclaimed shall be assessed and included in the EIA report.</td></tr>
<tr><td>40.</td><td>The frequency of public consultations should be included.</td><td>The frequency of public consultations or engagements conducted by the Project Proponent, PDP and EIA Consultant for the PSR project as of 6th of April 2016 is shown in the table below:

<table><tr><th></th><th>No. of Consultations</th></tr><tr><td>Project Proponent</td><td>14</td></tr><tr><td>PDP</td><td>82</td></tr><tr><td>EIA Consultant</td><td>12</td></tr><tr><td>TOTAL</td><td>108</td></tr></table>
The details of the outcome from these consultations shall be addressed and included in the EIA report.</td></tr>
<tr><td>41.</td><td>The Enterococci parameter should be added in the water quality baseline sampling and monitoring.</td><td>Enterococci sp. is an indicator of human faecal contamination; while E. Coli is a pathogenic indicator. The EIA study shall cover the impacts from reclamation and dredging activities; not the top-side development (e.g. Sewage Treatment Plant (STP), etc). Therefore, Enterococci sp. monitoring can always be done later during the EIA study for the STP.</td></tr>
<tr><td>42.</td><td>The SO_2 and NO_2 parameters should be added for air quality baseline sampling and monitoring.</td><td>The SO_2 and NO_2 parameters shall be added for air quality baseline sampling and monitoring. The results and assessment shall be included in the EIA report.</td></tr>
<tr><td>43.</td><td>Measures to control the sediment plume during construction activities should be included.</td><td>The measures to control the sediment plume during construction activities shall be included in the EIA report.</td></tr>
</table>

No.	Comments	Reviewer Panel	Response
44.	Transportation from quarry to the jetty; unloading to the barge should be included.	DOE	The location of the quarry and route from the quarry to the nearest jetty shall be indicated in the EIA report.
45.	Siltation at the river outlets should be addressed in the hydraulic study.	DID Pulau Pinang	Siltation at the river outlets shall be assessed in the hydraulic study and included in the EIA report.
46.	Shoreline monitoring during reclamation should be conducted.		Shoreline monitoring during reclamation activities shall be conducted and reported to JPS once the project works start.
47.	The baseline sampling stations for marine flora and fauna and water quality should be added and spread out to Pulau Betung area.	Prof. Madya Dr. Tan Shau Hwai	The baseline sampling stations for marine flora and fauna and water quality shall be added and spread out to Pulau Betung area. The results shall be assessed and presented in the EIA report.
48.	To include coral reefs in the list of Environmentally Sensitive Areas (ESAs).		Coral reefs shall be included in the list of ESAs as shown in *Chapter 6 – 6.9 Environmentally Sensitive Areas* and included in the EIA report.
49.	To include sediment size under sediment quality parameters.		The sediment particle size distribution from the sediment samples shall be included in the EIA report.
50.	To include photographic records for coral reef fishes study.		Photographic records for coral reef fishes study shall be included in the EIA report.
51.	To address the possible loss of fishing grounds.		Possible loss of fishing grounds shall be addressed in the EIA report.
52.	To propose suitable measures for possible affected hatcheries and aquacultures within project area.		Suitable measures for possible affected hatcheries and aquacultures within the project area shall be proposed and included in the EIA report.
53.	To address natural disaster such as tsunami; and frequency of storms happening at the project area.		Natural disaster such as tsunami; and frequency of storms happening at the project area shall be addressed in the EIA report.
54.	To state the threshold value of TSS that can be withstand by the marine flora and fauna.		The threshold value of TSS that can be withstand by the marine flora and fauna shall be defined in the EIA report.

No.	Comments	Reviewer Panel	Response
55.	Project activities such as beach nourishment and construction of jetties should be included.	En. Nor Razaman Hamzah	All activities involved in the reclamation and dredging works shall be included under Project Description in the TOR *(Chapter 4)* and EIA report.
56.	Other studies that are being conducted concurrently such as the SIA and FIA should be included in the TOR scoping.		Other concurrent studies being conducted with the EIA study shall be addressed and stated in the TOR *(Chapter 7)* and EIA report.
57.	The possible impacts on the existing drainage system water quality from the reclamation of the islands should be addressed.		The possible impacts on the existing drainage system water quality from the reclamation of the islands shall be addressed in the EIA report.
58.	The specification of the barges that will be used should be included.		The barges specification to be used in the Project shall be detailed and included in the EIA report.
59.	Comparison of different silt curtains' effectiveness and limitations based from experiences from other projects such as in Johor should be included to obtain the best possible method in containing plume.		The best type of silt curtain and method of installation of silt curtain shall be proposed and included in the EIA report.
60.	Locations of base camps, workshops, canteens etc should be identified.		The locations of base camps, workshops, canteens etc shall be identified and stated in the EIA report.
61.	The frequency of monitoring for each monitoring programme should be included.	Pn. Yasmin Rashid	The frequency of monitoring for each monitoring programme shall be included in the TOR *(Chapter 10)* and EIA report.
62.	Sand sourcing and disposal activity should be addressed.		Sand sourcing and disposal activity shall be described in the EIA report.
63.	Both benefits and risks to the fishermen from the project should be addressed.		Both benefits and risks to the fishermen from the project shall be addressed in the EIA report.
64.	Climate mitigation and adaptation with the presence of the man-made islands such as sea level rise, storm abnormalities, etc should be addressed to identify the safety and risks on the project itself.		The design of the man-made islands shall consider the impacts of sea level rise and extreme storm events.

No.	Comments	Reviewer Panel	Response
65.	The land use plan which includes the sewage treatment plant and other waste management components on the reclaimed islands should be stated.	Pn. Yasmin Rashid	The land use plan which includes the sewage treatment plant and other waste management components on the reclaimed islands shall be stated in the EIA report.
66.	The geotechnical stability of both seismic and hydrodynamic conditions should be assessed.	MBPP	Geotechnical stability of both seismic and hydrodynamic conditions shall be assessed and included in the EIA report.
67.	*Sub-section 4.2.1, Page 4-5: Island Concept* The island concept was described to maintain access channels having width of 150 to 250 m wide. The proposed channel bed level, side slope as well as whether that 150/250 m is bottom width or top width should be mentioned. Considering the existing bed material, the Project Proponent also needs to clarify whether it was assumed sandy material or muddy. This is later to be reflected in the investigation of sediment transport i.e. whether ST or MT (or both) to be used in the hydraulic study accordingly.	Prof. Madya Ahmad Mustafa Hashim	Soil investigation works have been conducted within the Project area. The appropriate module will be used for sediment transport.
68.	*Sub-section 4.4.2.1, Page 4-9: Dredging of Temporary Access Channel & Sub-section 4.4.2.6, Page 4-11: Dredging of Flushing Channel and Channels between Reclaimed Islands* - To provide estimated volume to be dredged and disposed. - To specify whether the indicative potential disposal area (Figure 4.7) is a designated disposal area by Jabatan Laut.		The estimated volume to be dredged and disposed off is 7 million m^3. Currently, the Project Proponent will identify candidate disposal sites in consultation with the Marine Department and other relevant authorities.
69.	*Sub-section 4.6.5, Page 4-13: Airport Extension* It was mentioned that a proposed extension of the existing Bayan Lepas International Airport will be allocated on Island A. It was not clear whether this will involve extension of the runway etc connecting from the existing Penang Island and		There is no airport runway extension towards the reclaimed islands.

No.	Comments	Reviewer Panel	Response
	Island A. If yes, then this has to be reflected on the layout and the hydraulic study need to account for any adjustment of shape required for this purpose.	Prof. Madya Ahmad Mustafa Hashim	
70.	*Sub-section 6.9, Page 6-29: Environmentally Sensitive Areas (ESAs)* It was stated with reference to NPP24 (page 2-5 of TOR) that such coastal reclamation shall not be permitted at areas where there are other sensitive ecosystems such as mangroves, mudflats, coral reefs, turtle landing sites etc. As described in sub-sections 6.9 and Figure 6.12 in the TOR, at least one of these elements (turtle landing sites) seems to exist within or nearby the proposed project area. How would the above affect the proposed project application?		The current existence, relevance and health of the ecosystems identified in NPP 2 are assessed in this study. For turtle landing the site, identification is made whether the information is based on one-off or occasional observation or whether the site is an active nesting ground. The results of the assessment will be informed to the Project Proponent for deliberation.
71.	*Sub-section 7.1.8, Page 7-13 and 7-14: Hydraulic Study* - Hydrographic survey need to be included. Its coverage area and other technical details of the proposed hydrographic and topographic survey need to be provided. - Description of the other oceanographic data such as current flow measurement and water level measurement does not include map showing respective locations. Similarly, need more details for the proposed bed sampling and suspended sediment sampling i.e. numbers of samples and location map. - The overall hydraulic study need to assess all phases of the project implementation. Since different parcels of each of the three-island development will gradually take shape in a unique way, the impacts during development phase need to be addressed accordingly.		The hydrographic and topographic survey conducted for this Project will be presented in the report. The locations of measurement of tides, currents, sea bed sampling & water sampling (for TSS analysis) can be presented in the report. The measurements are done in compliance with prevailing DID requirements for numerical modelling. Project phasing is simulated. Impacts during the development of each of the reclaimed island will be assessed with due consideration given to the construction method and the worst case location for sediment plume dispersion.

No.	Comments	Reviewer Panel	Response
72.	*Sub-section 7.1.8.2, Page 7-16: Task III – Sediment Transport Impact* The use of only MIKE21 MT for the investigation need to be substantiated. The project proponent also need to verify whether there is no necessity to also use MIKE21 ST to address the sediment transport for sandy material (refer to comment no. 1 above)	Prof. Madya Ahmad Mustafa Hashim	The appropriate module shall be utilized to simulate sediment transport based on the dominant surfacial bed material.
73.	*Sub-section 8.3, Page 8-4: Methodology of Impact Assessment* The proposed prediction method to assess the coastal erosion and sediment transport are not consistent with the earlier description on page 7-16. To ensure the appropriate and relevant method is used based on the prevailing site condition.		The appropriate and relevant method based on the prevailing site condition shall be used in assessing the coastal erosion and sediment transport.
74.	The Penang State Government intends to upgrade the Penang Transport System which makes it crucial for the PSR as a funding model to be developed.	UPEN	This statement is noted.
75.	The RSNPP 2020 is still at draft stage, not gazetted and shall include the proposed Project.	MBPP	This statement is noted.
76.	To make sure that the proposed Project to go through the State Planning Committee (SPC) in June and the National Physical Planning Council (NPPC) in November.	JPBD	This statement is noted.
77.	More detailed and clear current and future land use plans have to be included in the TOR and EIA report.	Pn. Yasmin Rashid	A land use plan showing the 5-km radius with 250 m intervals is shown in the revised TOR *(Chapter 6: Figure 6.9)*. Any changes of the gazetted land use shall be updated and included in the EIA report.

No.	Comments	Reviewer Panel	Response
78.	To integrate the eco-hub concept in the TOR and the EIA report. The Project Proponent should also describe in the EIA report whether will there be any public beach for recreational activities with the islands' reclamation.	Pn. Yasmin Rashid	There will be public beaches along the southern part of all three (3) island edges as indicated in the revised TOR *Chapter 4: Figure 4.6* to cater for recreational activities. This shall also be included in the EIA report.
79.	To state in the EIA study the total fish catches especially in Gertak Sanggul at the proposed project area.	Prof. Madya Dr. Tan Shau Hwai/DOF	The total fish catches at the proposed Project area shall be stated in the EIA report under marine biological study.
80.	The total dredged material to be dumped at the disposal ground should be stated.	PPC	The total dredged material to be dumped at the disposal ground is approximately 7 million m^3.
81.	The EIA report must include findings from soil investigation (SI) and bathymetric survey.	PPC	Findings from SI and bathymetric survey shall be included in the EIA report.
82.	The activities related to beach nourishment must be described in the EIA report.	En. Nor Razaman Hamzah/DOE	The activities related to beach nourishment shall be described in the EIA report under sub-section Project Activities.
83.	To state the risk frequency of natural disasters and climate change issues in the EIA report. A seismic report of the project area must also be included.	MBPP	The development will be designed to storm conditions and sea level rise. Tsunami study will be undertaken for the development.
84.	To explore other alternatives in controlling sediment plume besides silt curtain.	DOE	Other alternatives in controlling sediment plume besides silt curtain shall be explored.
85.	Flushing channels shall be dredged between the three (3) man-made islands and between the reclaimed islands and the Penang Island.	En. Nor Razaman Hamzah	Channels between the three (3) man-made islands and between the reclaimed islands and the Penang Island shall be dredged to improve navigation and flushing.
86.	Four (4) fishermen's jetties shall be built. The Project Proponent shall have to ask for consent from the Ministry of Transport (MOT) regarding the construction of the jetties.	MBPP	Construction of fisherman's jetties will be discussed and confirmed with the Fishermen taskforce, which comprise of LKIM, DOF, UPEN and other relevant agencies. The information shall be included in the EIA report.

<table>
<tr><th>No.</th><th>Comments</th><th>Reviewer Panel</th><th>Response</th></tr>
<tr><td>87.</td><td>To conduct public engagements at the early stage of the EIA study to give the right perception to the public about the proposed Project to reduce complaints and protests. It should be noted that protests from the fishermen shall be under the responsibility of the Penang State Government as the Project Proponent. At least one (1) public dialogue must be conducted during the EIA study stage. Other than that, information sharing system or a channel for the public to voice out complaints should be provided.</td><td>Pn. Yasmin Rashid/DOE</td><td>Public engagements or consultations were conducted by the EIA consultant. On top of that, public engagement or consultation by Project Proponent and PDP is still on-going and numbers of engagement will be updated in the EIA report. Please refer to the table below for the Public engagements or consultations that was conducted:
<table><tr><td></td><td>No. of Consultations</td></tr><tr><td>Project Proponent</td><td>14</td></tr><tr><td>PDP</td><td>82</td></tr><tr><td>EIA Consultant</td><td>12</td></tr><tr><td>TOTAL</td><td>108</td></tr></table>A public dialogue shall be conducted as part of the requirements of the EIA (Second Schedule) study in which the feedback from the public shall be incorporated in the EIA report. Information sharing system or a channel for the public's complaints has already been provided through the Penang State Government's website (http://pgmasterplan.penang. gov.my/index.php/ms/).</td></tr>
<tr><td>88.</td><td>An Environmental Economic Valuation (EEV) study must be conducted at the early stage of the project implementation to assess the suitability of the project and must be included in the EIA report.</td><td>DOE</td><td>EEV study shall be conducted and incorporated in the EIA report.</td></tr>
<tr><td>89.</td><td>A Fisheries Impact Assessment (FIA) has been conducted which also covers aquacultures and hatcheries. The findings must be included in the EIA report.</td><td>DOF</td><td>The findings of the FIA shall be included in the EIA report. Cost Benefit Analysis (CBA) shall also be undertaken on loss of fishing grounds and its impacts on the fishermen's livelihood.</td></tr>
<tr><td>90.</td><td>The findings from social studies or Social Impact Assessment (SIA) must be included in the EIA report.</td><td>DOE</td><td>The findings of the SIA study shall be incorporated in the EIA report.</td></tr>
</table>

Appendix A

Comments from Expert Panels and Agencies

Jabatan Alam Sekitar
Department of Environment
Kementerian Sumber Asli & Alam Sekitar
Ministry of Natural Resources & Environment
Aras 1 - 4, Podium 2 & 3, Wisma Sumber Asli
No. 25, Persiaran Perdana, Presint 4
62574 PUTRAJAYA
MALAYSIA

Tel : 03-8871 2000
Faks : 03-8889 1040 /
03-8868 9987 (Pentadbiran)
03-8869 1978 (Kewangan)
03-8868 2693 (Integriti)
03-8886 4151 (Udara)
03-8889 1042 (Komunikasi Strategik)
03-8889 1045 (Penilaian)
03-8888 4070 (Air Dan Marin)
03-8888 0067 (Penguatkuasaan)
03-8888 9964 (Teknologi Maklumat)
03-8888 6120 (Bahan Berbahaya)
03-8889 1973/1975 (Bilik Operasi)
Laman Web : www.doe.gov.my

Rujukan kami : JAS 50/013/100/079
Jilid 19(c)
Tarikh: 14 April 2016

Pejabat Setiausaha Kerajaan
Kerajaan Negeri Pulau Pinang
Kompleks Pentadbiran Kerajaan Pulau Pinang
Paras 25, Komtar
Georgetown
10503 PULAU PINANG **Faks : 04-261 8618**
(u.p.: YB. Dato' Seri Farizan Bin Darus)

YB. Dato' Seri,

MINIT MESYUARAT PANEL PENGULAS BAGI MENGKAJI BIDANG RUJUKAN (*TERMS OF REFERENCE, TOR*) BAGI LAPORAN PENILAIAN KESAN KEPADA ALAM SEKELILING (EIA) BAGI CADANGAN PROJEK *"PROPOSED RECLAMATION AND DREDGING WORKS FOR THE SOUTH RECLAMATION SCHEME (SRS),PENANG"*

Saya dengan hormatnya diarah merujuk kepada perkara di atas dan mesyuarat panel Pengulas bagi mengkaji Bidang Rujukan *(Terms Of Reference, TOR)* cadangan projek di atas yang telah diadakan pada 6 April 2016 adalah berkaitan.

2. Bersama-sama ini dikemukakan sesalinan Minit Mesyuarat di atas untuk tindakan pihak YBhg Dato' selanjutnya.

Sekian dimaklumkan

"BERKHIDMAT UNTUK NEGARA"

Saya yang menurut perintah,

(ROHIMAH BINTI AYUB)
b.p. KetuaPengarah Alam Sekitar Malaysia

RECEPTION
21 APR 2016
DR. NIK & ASSOCIATES SDN. BHD. (327065-V)

s.k:

1) Pengarah
Jabatan Alam Sekitar Negeri Pulau Pinang
Aras Bawah – Zon B
Wisma Persekutuan
Seberang Perai Utara
13200 KEPALA BATAS **Faks : 04-5157455**

2) Pengarah Urusan
SRS Consortium
73-3A-1, Ideal @ The One
Jalan Mahsuri
11950 BAYAN LEPAS **Faks : 04 – 641 1776**

3) Dr. Nik & Associates Sdn. Bhd.
No. 22 & 24, Jalan Wangsa Delima 6,
Kuala Lumpur Suburban Centre, (KLSC)
Section 5, Pusat Bandar Wangsa Maju
53330 SHAH ALAM
Tel : 03 – 4145 8888
Faks : 03 – 4145 8877
(u.p.:Puan Rosniza Ramly)

4) Fail Berkenaan

MINIT MESYUARAT
BIDANG RUJUKAN (*TERMS OF REFERENCE*, TOR) BAGI LAPORAN PENILAIAN KESAN KEPADA ALAM SEKELILING (EIA) TERPERINCI BAGI *"PROPOSED RECLAMATION AND DREDGING WORKS FOR THE SOUTH RECLAMATION SCHEME (SRS),PENANG"*

Tarikh	:	6 April 2016 (Rabu)
Masa	:	9:30 pagi – 1:45 petang
Tempat	:	Bilik Mesyuarat Cempaka Jabatan Alam Sekitar (JAS) Aras 3, Podium 3, Wisma Sumber Asli, **PUTRAJAYA**

KEHADIRAN

JABATAN ALAM SEKITAR

1.	En. Ridzuan Abd. Rashid	JAS Ibu Pejabat (Pengerusi)
2.	Puan Norhayati Yahaya	JAS Negeri Pulau Pinang

WAKIL AGENSI

3.	Puan Nur Aliaa Shafie	BASPI NRE
4.	Ir. Sreedaran Raman	Jabatan Pengairan dan Saliran (JPS) Malaysia
5.	Encik Wan Andery Wan Mahmood	Jabatan Perancangan Bandar Desa (JPBD) Malaysia
6.	Encik Jasrul Nizam bin Jahaya	Bahagian Air dan Marin, JAS Ibu Pejabat
7.	Encik Zepri bin Saad	Unit Perancang Ekonomi Negeri Pulau Pinang (UPEN)
8	Encik Zamani Md. Zain	Unit Perancang Ekonomi Negeri Pulau Pinang

		(UPEN)
9.	Encik Mohd. Hanafi bin Mohd. Yaacob	Majlis Bandaraya Pulau Pinang
10.	Puan Zuraini Mat Rasit	Majlis Bandaraya Pulau Pinang
11.	Ir. Mohd. Shahman bin Shaari	JPS Negeri Pulau Pinang
12.	Encik Amphai Ee Bau	JPS Negeri Pulau Pinang
13.	Encik Mohammad Saifullah bin Yusoff	Suruhanjaya Pelabuhan Pulau Pinang
14.	Encik Ismail bin Ibrahim	Jabatan Perikanan Malaysia
15.	Tuan Haji Azahari Othman	Jabatan Perikanan Malaysia
16.	Tuan Haji Jamil bin Shaari	Jabatan Perikanan Malaysia
17.	Encik Zulkeffli bin Md Desa	Suruhanjaya Pelabuhan Pulau Pinang

PAKAR PENGULAS INDIVIDU

18.	Prof. Madya Dr. Tan Shau Hwai	Pakar Pengulas Ekologi Marin
19.	En. Nor Razaman Hamzah	Pakar Pengulas Land Distrubing Pollution Prevention and Mitigation Measures
20.	Puan Yasmin Rashid	NGO

PENGGERAK PROJEK (Kerajaan Negeri Pulau Pinang/SRS Consortium Sdn.Bhd)

21.	Puan Vishanthni Kanasan	Kerajaan Negeri Pulau Pinang

22.	Encik Andy Lee Choon Foh	SRS Consortium Sdn.Bhd
23.	Puan Lui Lee Yen	SRS Consortium Sdn.Bhd
24.	Encik Andrew Tham	SRS Consortium Sdn.Bhd
25.	Puan Poh Chia Ching	SRS Consortium Sdn.Bhd
26.	Encik Amos Ling Hock Sing	SRS Consortium Sdn.Bhd
27.	Puan Lim Wei Wei	SRS Consortium Sdn.Bhd
28.	Encik Asrul Zahidi	SRS Consortium Sdn.Bhd
29.	Encik Azmi Mohamed	SRS Consortium Sdn.Bhd
30.	Puan Lim Pui Chin	SRS Consortium Sdn.Bhd

PERUNDING EIA (Dr. Nik Associates Sdn Bhd.)

31. Puan Rosniza Ramli
32. Ir. Iwan Tan Soffian Tan
33. Ir. Dr. Zaki Zainuddin
34. Capt. Ismail Hashim
35. Dr. Wan Juliana Wan Ahmad
36. Puan Puvanesuri a/p Sandera Sagaren
37. Prof. Dr. Maimon Abdullah
38. Puan Shareena Azliani binti Abdul Aziz
39. Puan Norsyakirin binti M. Bakari
40. Encik Muhammad Fauzan bin Pauzi

URUSETIA JAS IBU PEJABAT

41. Puan Rohimah Ayub

42. Puan Nor Dalilah Abdul Rashid

43. Puan Katinah Hussain

TIDAK HADIR (dengan maaf)

30. Prof. Dr. Ahmad Mustafa Hashim (Hidraulik)

31. Dr. Zainab Zubir (Sosio Ekonomi)

PENDAHULUAN

1. Tuan Pengerusi mengalu-alukan kehadiran semua ahli mesyuarat bagi membincangkan Bidang Rujukan(TOR) bagi Laporan Penilaian Kesan Kepada Alam Sekeliling (EIA) Bagi *"Proposed Reclamation And Dredging Works For The South Reclamation Scheme (SRS), Penang"*. Dalam hal ini, tuan pengerusi turut mengucapkan terima kasih atas kehadiran semua ahli mesyuarat terutamanya Kerajaan Negeri Pulau Pinang selaku Pemaju Projek dan *'Appointed Individuals"* atas komitmen yang diberikan bagi kelancaran projek ini.

2. Tuan Pengerusi memaklumkan mesyuarat mengenai tujuan TOR bagi sesuatu kajian EIA Terperinci adalah untuk melihat isu-isu kritikal di peringkat awal sebelum kajian EIA dilaksanakan. Proses ini dapat memberi nilai tambah kepada perancangan sesuatu projek dari segi *cost effective* dan dapat memastikan impak yang minima kepada alam sekitar akibat pelaksanaan cadangan projek berkenaan. Pendekatan holistik dalam pelaksanaan projek khasnya serta penjagaan alam sekitar amnya merupakan satu pendekatan yang sangat baik dan perlu diteruskan.

3. Tuan Pengerusi seterusnya menjemput Pemaju Projek serta Perunding EIA untuk menyampaikan pembentangan TOR Bagi *"Proposed Reclamation And Dredging Works For The South Reclamation Scheme (SRS),Penang"*.

Untuk makluman

PEMBENTANGAN OLEH PEMAJU PROJEK DAN JURURUNDING EIA

4. Pemaju projek, Kerajaan Negeri Pulau Pinang memaklumkan mesyuarat mengenai cadangan *Proposed Reclamation And Dredging Works For The South Reclamation Scheme (SRS),Penang"*, antaranya seperti berikut:-

a. Projek penambakan di bahagian selatan Pulau Pinang yang dikenali dengan nama *"South Reclamation Scheme- SRS"* akan ditukar kepada *'Penang South Reclamation – PSR"* . Namun begitu, Laporan EIA yang akan dikemukakan tetap akan menggunakan nama *"South Reclamation Scheme- SRS"*

b. Tanah yang akan ditambak merupakan tanah milik Kerajaan Negeri dan akan dijual bagi membiayai Penang Transport Master Plan (PTMP) yang merupakan satu keperluan bagi mengatasi masalah kesesakan jalanraya di Pulau Pinang. Dalam hal berkaitan, SRS Consortium Sdn. Bhd merupakan pemaju projek bersama dengan Kerajaan Negeri Pulau Pinang.

c. *Projek dijangka siap pada tahun 2065 dan dijangka memberi pulangan sebanyak RM40,000 billion GDP serta 300,000 peluang pekerjaan baru.*

d. Cadangan projek ini adalah berkonsepkan penambakan 3 pulau buatan dengan pembesaran Kawasan Perindustrian Bebas (FIZ) di atas Pulau A dan pembangunan berkonsepkan *"Smart City Concept"*.

e. Cadangan projek ini akan turut menyediakan perumahan mampu milik bagi mengatasi masalah perumahan dan penempatan di Pulau Pinang khususnya bagi golongan berpendapatan rendah.

f. Pihak UPEN telah menubuhkan pasukan *task force* bagi melihat kesan projek penambakan ini dari segi alam sekitar, sosial dan sebagainya. Inisiatif kerajaan negeri termasuk mengadakan forum dan dialog bersama *stakeholder* bagi memastikan kelancaran perjalanan projek ini.

Untuk makluman

5. Jururunding EIA seterusnya telah membentangkan skop kajian EIA (bidang rujukan) yang akan dilaksanakan di dalam kajian EIA Terperinci, dari segi isu-isu kritikal, metodologi persampelan dan kajian, seperti di Lampiran 1.

Untuk makluman

ISU-ISU YANG TELAH DIBANGKITKAN DAN DIBINCANGKAN

6. Mesyuarat mengambil maklum penjelasan dari UPEN Pulau Pinang bahawa Kerajaan Negeri Pulau Pinang berhasrat untuk menaiktaraf sistem pengangkutan Pulau Pinang dan dalam hal ini pembangunan projek ini adalah penting selaras dengan hasrat Kerajaan Negeri.

Untuk tindakan: Pemaju projek/
Jururunding EIA

7. Mesyarat mengambil maklum bahawa Pelan Struktur Pulau Pinang 2020 masih di peringkat deraf, belum warta dan akan memasukkan cadangan projek di dalamnya.

Untuk tindakan: Pemaju projek/
Jururunding EIA

8. Mesyuarat bersetuju supaya pemaju projek memastikan cadangan projek akan melalui State Planning Committe (SPC) pada bulan Jun dan Majlis perancang Fizikal Negara (MPFN) pada bulan November.

Untuk tindakan: Pemaju projek/
Jururunding EIA

9. Mesyuarat bersetuju supaya Pemaju projek/Jururunding EIA mengemukakan semula pelan guna tanah semasa dan jangka panjang yang lebih jelas dan terperinci

Untuk tindakan: Pemaju projek/
Jururunding EIA

10. Mesyuarat meminta pemaju projek mengintegrasikan konsep *eko-hub* di dalam TOR dan Laporan EIA yang akan dikemukakan. Selain itu, pemaju diminta menjelaskan di dalam TOR/ Laporan EIA dengan penambakan ini, masihkah terdapat kawasan pantai bagi orang ramai untuk menjalankan aktiviti rekreasi.

Untuk tindakan: Pemaju projek/

Jururunding EIA

11. Mesyarat mengambil maklum bahawa pemaju projek /Jururunding EIA perlu menyatakan kekerapan pengawasan selain lokasi persampelan yang dinyatakan di dalam Laporan EIA bagi semua program pengawasan (air,udara, bunyi bising,getaran dll).

Untuk tindakan: Pemaju projek/
Jururunding EIA

12. Mesyarat mengambil maklum bahawa supaya pemaju projek /Jururunding EIA perlu menyatakan sekiranya terdapat *coral reef* atau pendaratan penyu di Pulau Kendi dan Pulau Betong di dalam laporan yang akan dikemukakan.

Untuk tindakan: Pemaju projek/
Jururunding EIA

13. Mesyuarat meminta pemaju projek menjelaskan jumlah tangkapan ikan terutama di kawasan Gertak Sanggul di dalam kajian yang akan dijalankan.

Untuk tindakan: Pemaju projek/
Jururunding EIA

14. Mesyuarat bersetuju supaya pemaju projek /Jururunding EIA menambah bilangan lokasi persampelan data garis dasar kualiti air marin dan *macro benthos* di sepanjang lokasi cadangan projek termasuk di kawasan selatan tapak projek, dan tidak terhad kepada di kawasan cadangan penambakan pulau sahaja.

Untuk tindakan: Pemaju projek/
Jururunding EIA

15. Mesyarat mengambil maklum bahawa kajian *water quality* perlu mengambil kira parameter *Enterococci* selain *E.Coli*.

Untuk tindakan: Pemaju projek/
Jururunding EIA

16. Mesyuarat mengambil maklum bahawa 20 opsyen konfigurasi pulau buatan telah dikaji. Mesyuarat turut mengambil maklum bahawa persisiran pantai merupakan ekosistem sensitif yang patut dipelihara. Dalam hal ini, pihak pemaju dipohon untuk menentukan opsyen konfigurasi pulau terbabit berdasarkan kajian hidraulik. Pemaju projek turut diminta untuk

menyatakan pada tahap manakah dapatan dari kajian hidraulik yang dijalankan akan menentukan bahawa projek ini tidak boleh diteruskan.

Untuk tindakan: Pemaju projek/
Jururunding EIA

17. Mesyarat mengambil maklum bahawa kerja penambakan akan mengubah morfologi pantai. Dalam hal ini, kajian hidraulik perlu dijalankan dan perlu mendapat kelulusan Jabatan Pengairan dan Saliran Malaysia (JPS) mengikut keperluan JPS bagi pembangunan di persisiran pantai berdasarkan Garispanduan JPS 1/97. Kajian hidraulik termasuk kajian *sediment transport* hendaklah diluluskan terlebih dahulu sebelum kepulusan laporan EIA dibuat. Mesyuarat mengambil maklum bahawa pembangunan dijalankan secara berfasa dan kelulusan laporan hidraulik adalah untuk dua tahun.

Untuk tindakan: Pemaju projek/
Jururunding EIA

18. Mesyuarat mengambil maklum bahawa *TOR bagi "Proposed Reclamation And Dredging Works For The South Reclamation Scheme (SRS),Penang"* perlu mengambilkira sumber bahan tambak, kawasan pelupusan serta aktiviti pengorekan dan penambakan itu sendiri. Ini memandangkan bahawa aktiviti pengangkutan pasir itu sama ada dari kawasan sumber bahan ke kawasan penambakan atau dari kawasan penambakan ke kawasan pelupusan akan memberikan impak terhadap alam sekitar, trafik dan pengangkutan.

Untuk tindakan: Pemaju projek/
Jururunding EIA

19. Mesyuarat mengambil maklum bahawa jumlah *fill* adalah 180,000m^3. Laporan perlu nyatakan jumlah bahan buangan *(dumping)*.

Untuk tindakan: Pemaju projek/
Jururunding EIA

20. Laporan EIA perlu menyatakan penemuan dari *Soil Investigation Report dan Kajian Bathimetry*.

Untuk tindakan: Pemaju projek/
Jururunding EIA

21. Mesyuarat mengambil maklum bahawa pemaju perlu menyatakan berkenaan aktiviti- aktiviti berkaitan dengan projek ini termasuk *"beach nourishment"* di dalam laporan EIA yang akan disediakan.

Untuk tindakan: Pemaju projek/
Jururunding EIA

22. Mesyarat mengambil maklum bahawa supaya pemaju projek /Jururunding EIA perlu menyatakan kejadian bencana alam semula jadi (frekuensi,risiko) serta menyatakan isu *climate change* di dalam laporan. *Soismic report* kawasan tersebut perlu disertakan di dalam laporan memandangkan kawasan tersebut adalah kawasan berhampiran gempa bumi aktif.

Untuk tindakan: Pemaju projek/
Jururunding EIA

23. Mesyuarat meminta supaya Jururunding memberi alternatif terhadap *silt curtain* memandangkan ia bukanlah satu penyelesaian tunggal terhadap masalah kelodakan. Masih terdapat beberapa pilihan lain yang perlu dikaji dan dicadangkan oleh pemaju.

Untuk tindakan: Pemaju projek/
Jururunding EIA

24. Mesyuarat mengambil maklum bahawa *flushing chanel* akan dibuat di antara 3 pulau buatan dan antara daratan daratan (Gertak Sanggul, Teluk Kumbar, Damar Laut) dengan 3 pulau tersebut.

Untuk tindakan: Pemaju projek/
Jururunding EIA

25. Mesyuarat mengambil maklum bahawa 4 jeti nelayan baru yang akan dibina bagi kemudahan nelayan di kawasan projek. Pemaju projek/Jururunding EIA perlu memohon kebenaran daripada Kementerian Pengangkutan Malaysia berhubung pembinaan jeti tersebut.

Untuk tindakan: Pemaju projek/
Jururunding EIA

26. Mesyuarat bersetuju supaya pemaju projek/Jururunding EIA menjalankan *public engagement* di peringkat awal kajian EIA supaya orang awam mendapat pendedahan dan mendapat persepsi yang betul mengenai

cadangan projek dengan mengemukakan *project option* yang munasabah untuk dikongsi dengan orang awam bagi mengurangkan aduan dan bantahan. Dalam hal berkaitan, mesyuarat turut mengambil maklum bahawa bantahan dari nelayan merupakan tanggungjawab Kerajaan Negeri selaku pemaju projek.Sekurang-kurangnya satu dialog awam perlu dijalankan semasa peringkat kajian EIA .Selain itu, sistem perkongsian maklumat dan saluran aduan awam perlu disediakan.

Untuk tindakan: Pemaju projek/
Jururunding EIA

27. Mesyarat mengambil maklum bahawa kajian Environmental Economic Valuation (EEV) perlu pada peringkat awal pelaksanaan projek bagi melihat kesesuaian projek dan merupakan maklumat yang sangat berguna kepada pemaju projek. Dalam hal ini, mesyuarat berseluju supaya pemaju projek /Jururunding EIA perlu memasukkan hasil penemuan ke dalam laporan EIA.

Untuk tindakan: Pemaju projek/
Jururunding EIA

28. Mesyuarat mengambil maklum kenyataan Pemaju bahawa *fisherman impact assessment* telah dijalankan dan laporan akan dikemukakan di dalam *Focus Group Discussion*. *Fisherman impact assessment* ini termasuk penternakan ikan serta pembenihan ikan. Dalam hal ini, mesyuarat meminta supaya hasil penemuan *fisherman impact assessment* ini dimasukkan di dalam laporan EIA. Mesyuarat turut mengingatkan bahawa EIA bukanlah alat penyelesaian isu sosial sesuatu projek dan komitmen di dalam laporan EIA merupakan komitmen pemaju projek dan dalam hal ini, ia merupakan komitmen Kerajaan Negeri Pualau Pinang Mesyuarat turut meminta supaya pemaju mengenalpasti jumlah kehilangan/*"total lost"* akibat kehilangan *"fishing ground"* dan apakah nasib nelayan yang berada di kawasan tersebut terutama bagi pemegang lesen perikanan 5 km ke bawah.

Untuk tindakan: Pemaju projek/
Jururunding EIA

29. Mesyuarat mengambil maklum bahawa Kajian EIA tidak termasuk kajian sosial yang mana ini merupakan kajian yang perlu dijalankan di peringkat kerajaan negeri. Pemaju hanya perlu menyatakan hasil penemuan tersebut di dalam Laporan EIA.

Untuk tindakan: Pemaju projek/
Jururunding EIA

30. Mesyarat mengambil maklum bahawa pemaju projek /Jururunding EIA perlu menyatakan risiko projek selain dari faedah kepada penduduk supaya kajian yang dibuat adalah adil dan member gambaran sebenar kesan pelaksanaan projek ke atas penduduk. Dalam hal berkaitan, mesyuarat mengambil maklum bahawa social dynamics masyarakat setempat akan berubah. Pemaju projek /Jururunding EIA perlu menyatakan nyatakan impak sosial jangka panjang projek tersebut terhadap penduduk setempat. Cadangan mitigasi perlu melihat terhadap penambahbaikan terhadap taraf hidup kepada penduduk.

Untuk tindakan: Pemaju projek/
Jururunding EIA

31. Mesyuarat bersetuju supaya pemaju projek /Jururunding EIA menyatakan penempatan pekerja semasa pembinaan.

Untuk tindakan: Pemaju projek/
Jururunding EIA

KEPUTUSAN MESYUARAT

32. Mesyuarat bersetuju bahawa TOR yang telah dikemukakan hendaklah dikemaskini dalam tempoh dua (2) minggu dari tarikh mesyuarat ini dengan mengambilkira kesemua perkara yang telah dibangkitkan dalam mesyuarat ini dan juga ulasan-ulasan bertulis daripada ahli panel pengulas yang telah dikemukakan.

33. Ringkasan isu-isu yang telah dibangkitkan adalah seperti di **Lampiran 2**.

Untuk tindakan: Pemaju projek/
Jururunding EIA

PENUTUP

34. Mesyuarat ditangguhkan pada jam 1:45 tengahari dengan ucapan terima kasih dari Tuan Pengerusi kepada semua yang hadir.

Untuk makluman

Disediakan oleh

.....

(NOR DALILAH ABDUL RASHID)
Penolong Pengarah

Disemak oleh

.....

(ROHIMAH AYUB)
Ketua Penolong Pengarah Kanan

Diluluskan Oleh

.....

(RIDZUAN RASHID)
Ketua Penolong Pengarah Kanan
Bahagian Penilaian

LAMPIRAN 2

ISU-ISU YANG TELAH DIBANGKITKAN DI DALAM MESYUARAT MEMBINCANGKAN BIDANG RUJUKAN (TOR) BAGI LAPORAN EIA) BAGI
"PROPOSED RECLAMATION AND DREDGING WORKS FOR THE SOUTH RECLAMATION SCHEME (SRS),PENANG"

BIL	PERKARA/ULASAN	PANEL PENGULAS/AGENSI	TINDAKAN	MAKLUMBALAS PEMAJU / PERUNDING EIA
1	Kenyataan Keperluan			
	1.1 Kerajaan Negeri Pulau Pinang berhasrat untuk menaiktaraf sistem pengangkutan Pulau Pinang dan dalam hal ini pembangunan projek ini adalah penting selaras dengan hasrat Kerajaan Negeri.	UPEN	Pemaju projek/ Jururunding EIA	
	1.2 Pelan Struktur Pulau Pinang 2020 masih di peringkat draf, belum warta dan akan memasukkan cadangan projek di dalamnya.	MBPP		
	1.3 memastikan cadangan projek akan melalui State Planning Committe (SPC) pada bulan Jun dan Majlis perancang Fizikal Negara (MPFN) pada bulan November.	JPBD		
	1.4 mengemukakan semula pelan guna tanah semasa dan jangka panjang yang lebih jelas dan terperinci	Puan Yasmin		

BIL	PERKARA/ULASAN	PANEL PENGULAS/AGENSI	TINDAKAN	MAKLUMBALAS PEMAJU / PERUNDING EIA
1.5	mengintegrasikan konsep *eko-hub* di dalam TOR dan Laporan EIA yang akan dikemukakan. Selain itu, pemaju diminta menjelaskan di dalam TOR/ Laporan EIA dengan penambakan ini, masihkah terdapat kawasan pantai bagi orang ramai untuk menjalankan aktiviti rekreasi.	JAS		
2	**Alam Sekitar Sedia Ada dan Pensampelan Data Garisdasar**			
2.1	perlu menyatakan kekerapan pengawasan selain lokasi persampelan yang dinyatakan di dalam TOR bagi semua program pengawasan (air,udara, bunyi bising,getaran dll).	Puan Yasmin	Pemaju projek/ Jururunding EIA	
2.2	perlu menyatakan sekiranya terdapat *coral reef* atau pendaratan penyu di Pulau Kendi dan Pulau Betong di dalam laporan yang akan dikemukakan.	Dr. Aileen		
2.3	menjelaskan jumlah tangkapan ikan terutama di kawasan Gertak Sanggul di dalam kajian yang akan dijalankan.	Dr. Aileen/ Jabatan Perikanan		
2.4	menambah bilangan lokasi persampelan data garis dasar kualiti air marin dan *macro benthos*	Dr. Aileen		

BIL	PERKARA/ULASAN	PANEL PENGULAS/AGENSI	TINDAKAN	MAKLUMBALAS PEMAJU / PERUNDING EIA
	di sepanjang lokasi cadangan projek termasuk di kawasan selatan tapak projek, dan tidak terhad kepada di kawasan cadangan penambakan pulau sahaja.			
	2.5 kajian *water quality* perlu mengambil kira parameter *Enterococci* selain *E Coli.*	P(PP)		
3	**Kajian Impak dan Langkah Kawalan**			
	3.1 menentukan konfigurasi pulau terbabit berdasarkan kajian hidraulik. Pemaju projek turut diminta untuk menyatakan pada tahap manakah dapatan dari kajian hidraulik yang dijalankan akan menentukan bahawa projek ini tidak boleh diteruskan.	JPS/JAS	Pemaju projek/ Jururunding EIA	
	3.2 kajian hidraulik perlu dijalankan dan perlu mendapat kelulusan Jabatan Pengairan dan Saliran Malaysia (JPS) mengikut keperluan JPS bagi pembangunan di persisiran pantai berdasarkan Garispanduan JPS 1/97. Kajian hidraulik termasuk kajian *sediment transport* hendaklah diluluskan terlebih dahulu sebelum keputusan laporan EIA dibuat. Mesyuarat mengambil maklum bahawa pembangunan	JPS/JAS		

BIL	PERKARA/ULASAN	PANEL PENGULAS/AGENSI	TINDAKAN	MAKLUMBALAS PEMAJU / PERUNDING EIA
	dijalankan secara berfasa dan kelulusan laporan hidraulik adalah untuk dua tahun.			
3.3	perlu mengambilkira sumber bahan tambak, kawasan pelupusan serta aktiviti pengorekan dan penambakan itu sendiri. Ini memandangkan bahawa aktiviti pengangkutan pasir itu sama ada dari kawasan sumber bahan ke kawasan penambakan atau dari kawasan penambakan ke kawasan pelupusan akan memberikan impak terhadap alam sekitar, trafik dan pengangkutan.	JAS	Pemaju projek/ Perunding EIA	
3.4	Laporan perlu nyatakan jumlah bahan buangan *(dumping)*.	Penang Port		
3.5	Laporan perlu menyatakan penemuan dari *Soil Investigation Report dan Kajian Bathimetry.*	Penang Port		
3.6	perlu menyatakan aktiviti- aktiviti yang ada berkaitan *"beach nourishment"* bagi projek ini.	En. Norazaman/ JAS		
3.7	perlu menyatakan kejadian bencana alam semula jadi(frekuensi risiko) serta menyatakan isu *climate change* di dalam laporan. *Seismic report* kawasan tersebut perlu disertakan di	MBPP		

BIL	PERKARA/ULASAN	PANEL PENGULAS/AGENSI	TINDAKAN	MAKLUMBALAS PEMAJU / PERUNDING EIA
	dalam laporan memandangkan kawasan tersebut adalah kawasan berhampiran gempa bumi aktif.		Pemaju projek/ Jururunding EIA	
	3.8 memberi alternatif terhadap *silt curtain* memandangkan ia bukanlah satu penyelesaian tunggal terhadap masalah kelodakan. Masih terdapat beberapa pilihan lain yang perlu dikaji dan dicadangkan oleh pemaju.	JAS		
	3.9 *flushing chanel* akan dibuat di antara 3 pulau buatan dan di antara daratan (Gertak Sanggul, Teluk Kumbar, Damar Laut) dengan 3 pulau tersebut.	En. Norazaman MBPP		
	3.10 4 jeti nelayan baru yang akan dibina bagi kemudahan nelayan di kawasan projek. Pemaju projek/Jururunding EIA perlu memohon kebenaran daripada Kementerian Pengangkutan Malaysia berhubung pembinaan jeti tersebut			

BIL	PERKARA/ULASAN	PANEL PENGULAS/AGENSI	TINDAKAN	MAKLUMBALAS PEMAJU / PERUNDING EIA
4	**Sosio ekonomi**			
	4.1 Menjalankan *public engagement* di peringkat awal kajian EIA supaya orang awam mendapat pendedahan dan mendapat persepsi yang betul mengenai cadangan projek dengan mengemukakan *project option* yang munasabah untuk dikongsi dengan orang awam bagi mengurangkan aduan dan bantahan. Dalam hal berkaitan, mesyuarat turut mengambil maklum bahawa bantahan dari nelayan merupakan tanggungjawab Kerajaan Negeri selaku pemaju projek.Sekurang-kurangnya satu dialog awam perlu dijalankan semasa peringkat kajian EIA .Selain itu, sistem perkongsian maklumat dan saluran aduan awam perlu disediakan.	Puan Yasmin/JAS	Pemaju projek/ Jururunding EIA	
	4.2 kajian Environmental Economic Valuation (EEV) perlu pada peringkat awal pelaksanaan projek bagi melihat kesesuaian projek dan merupakan maklumat yang sangat berguna kepada pemaju projek. Dalam hal ini, mesyuarat bersetuju supaya pemaju projek /Jururunding EIA perlu memasukkan hasil pertemuan ke dalam laporan EIA.	JAS		
	4.3 *fisherman impact assessment* telah dijalankan			

BIL	PERKARA/ULASAN	PANEL PENGULAS/AGENSI	TINDAKAN	MAKLUMBALAS PEMAJU / PERUNDING EIA
	dan laporan akan dikemukakan di dalam *Focus Group Discussion*. *Fisherman impact assessment* ini termasuk penternakan ikan serta pemboenihan ikan. Dalam hal ini, mesyuarat meminta supaya hasil penemuan *fisherman impact assessment* ini dimasukkan di dalam laporan EIA. Mesyuarat turut mengingatkan bahawa EIA bukanlah alat penyelesaian isu sosial sesuatu projek dan komitmen di dalam laporan EIA merupakan komitmen pemaju projek dan dalam hal ini, ia merupakan komitmen Kerajaan Negeri Pualau Pinang. Mesyuarat turut meminta supaya pemaju mengenalpasti jumlah kehilangan/*"total lost"* akibat kehilangan *"fishing ground"* dan apakah nasib nelayan yang berada di kawasan tersebut terutama bagi pemegang lesen perikanan 5 km ke bawah.	Jabatan Perikanan	Pemaju projek/ perunding EIA	
4.4	Kajian EIA tidak termasuk kajian sosial yang mana ini merupakan kajian yang perlu dijalankan di peringkat kerajaan negeri. Pemaju hanya perlu menyatakan hasil penemuan tersebut di dalam Laporan EIA.	JAS		
4.5	perlu menyatakan risiko projek selain dari	Dr Yasmin		

BIL	PERKARA/ULASAN	PANEL PENGULAS/AGENSI	TINDAKAN	MAKLUMBALAS PEMAJU / PERUNDING EIA
	faedah kepada penduduk supaya kajian yang dibuat adalah adil dan memberi gambaran sebenar kesan pelaksanaan projek ke atas penduduk. Dalam hal berkaitan, mesyuarat mengambil maklum bahawa social dynamics masyarakat setempat akan berubah. Pemaju projek /Jururunding EIA perlu menyatakan nyatakan impak sosial jangka panjang projek tersebut terhadap penduduk setempat. Cadangan mitigasi perlu melihat terhadap penambahbaikan terhadap taraf hidup penduduk.			
	4.6 menyatakan penempatan pekerja semasa pembinaan.	JAS		

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PENGHANTARAN MAKLUMAT KELUAR

NO. FAKS. YANG DIHUBUNGI :

NO. RUJUKAN FAKS : **03-88891045 (PENILAIAN)** TARIKH : **13/4/2016**

KEPADA : **Dr. Nik & Associates Sdn. Bhd.** (03 - 41458871)

PERKARA : **Ulasan Dokumen TOR Jabatan Alam Sekitar Ibu Pejabat – Proposed Reclamation And Dredging Works For The South Reclamation Scheme (SRS) Penang**

NO. SALINAN YANG DIHANTAR TERMASUK MUKASURAT INI :

NAMA PENGHANTAR : KATINAH HUSSAIN

ULASAN DOKUMEN BIDANG RUJUKAN (TOR) JABATAN ALAM SEKITAR IBU PEJABAT

BAGI CADANGAN PROJEK

"PROPOSED RECLAMATION AND DREDGING WORKS FOR THE SOUTH RECLAMATION SCHEME (SRS),PENANG"

OLEH

KERAJAAN NEGERI PULAU PINANG/SRS CONSORTIUM SDN.BHD

PELAN PEMBANGUNAN (RANCANGAN FIZIKAL NEGARA-2)

1. Konsep cadangan projek penambakan laut ini dan pembangunan di atasnya hendaklah selaras dengan Rancangan Fizikal Negara-2 dan Rancangan Fizikal Zon Persisiran Pantai Negara di bawah Jabatan Perancangan Bandar dan Desa, Kementerian Kesejahteraan Bandar, Perumahan dan Kerajaan Tempatan seperti yang digariskan di bawah:-

    a. Penambakan persisiran pantai tidak digalakkan kecuali untuk pembangunan pelabuhan strategik berkepentingan negara.

    b. Penambakan persisiran pantai tidak dibenarkan di dalam atau berdekatan dengan kawasan ekosistem sensitif seperti taman laut, hutan paya bakau, tanah lumpur, terumbu karang, padang rumput laut, kawasan pendaratan penyu dan pantai pelancongan utama.

    c. Ia adalah penting untuk mengawal hakisan atau bagi tujuan penambakan pantai, atau mengembalikan tanah yang telah terhakis.

    d. Tidak akan menjejaskan rejim hidrologi semulajadi persisiran pantai dan proses persisiran pantai.

e. Faedah projek penambakan laut dalam bentuk pertumbuhan ekonomi dan kebaikan kepada masyarakat nyata sekali melebihi kos sosial dan alam sekitar

f. Tidak akan menjejaskan kestabilan kawasan projek dan persisiran pantai bersebelahan, termasuk pantai dan kawasan depan persisiran.

g. Sebarang permohonan penambakan hendaklah dirujuk kepada **Majlis Perancang Fizikal Negara**.

(i) Di bawah RFZPPN 6, Rancangan Fizikal Zon Persisiran Pantai Negara dinyatakan seperti berikut:-

a. Semua cadangan penambakan laut perlu dirujuk kepada Majlis Perancang Fizikal Negara.

b. Penambakan laut tidak akan digalakkan kecuali untuk pembangunan **pelabuhan strategik** yang mempunyai kepentingan nasional. Penambakan laut untuk tujuan menghasilkan pulau tiruan baru tidak akan dibenarkan.

c. Penambakan laut hanya akan dipertimbangkan dengan syarat syarat berikut:-

d. Semua kerja-kerja penambakan laut yang meliputi keluasan 20 hektar ke atas perlu mendapat kelulusan Laporan Penilaian Kesan Alam Sekitar.

2. Cadangan projek penambakan laut pulau buatan ini dan pembangunan di atasnya hendaklah selaras dengan Rancangan Struktur Negeri Pulau Pinang dan Rancangan Tempatan Daerah bagi kawasan berkenaan yang perlu dirujuk dan dinyatakan dengan jelas di dalam Laporan EIA Terperinci.

STATEMENT OF NEED

3. Kenyataan keperluan (perkara 3.5 muka surat 3-5) menyebut bahawa pembangunan ini bertujuan untuk menyediakan kawasan perumahan "mampu milik" yang baru di Pulau Pinang, namun begitu, pada fig.4-6 *(Land Use of the Proposed Reclaimed Islands)*, keluasan yang diperuntukan untuk perumahan "mampu milik" ini hanya 357 ekar. Perjelaskan agihan perumahan "mampu milik" dalam peratusan dan kaitkan dengan polisi kerajaan.

4. Kenyataan keperluan (perkara 3.7 muka surat 3-7) menyebut faedah kepada nelayan. Perjelaskan selaras dengan keperluan RFN.

KONSEP CADANGAN PROJEK

5. Sepertimana yang dinyatakan di atas, konsep cadangan projek penambakan laut ini dan pembangunan di atasnya hendaklah selaras dengan Rancangan Fizikal Negara-2 dan Rancangan Fizikal Zon Persisiran Pantai Negara, Rancangan Struktur Negeri atau Rancangan Tempatan kawasan berkenaan.

6 Komponen-komponen cadangan projek yang perlu dikaji dengan terperinci dan saintifik dan hendaklah merangkumi huraian projek yang lengkap, kajian impak dan cadangan langkah kawalan yang efektif adalah antaranya:-

(i) Penambakan Pulau A, B dan C :-.

a. Pemilihan ***layout*** **dan** ***landform*** **penambakan dan struktur penahan ombak (*breakwater*) perlu berdasarkan kepada beberapa opsyen yang telah diuji dengan menggunakan model hidraulik dan terbukti memberi kesan yang paling minima kepada alam sekitar, sosio ekonomi dan aspek navigasi.**

b. Kajian EIA hendaklah termasuk aktiviti sand mining dan disposal area untuk bahan pengorekan serta pengangkutan bahan tambakan dan disposal.

c. Menjelaskan pemilihan kaedah penambakan laut (*method statement*) yang akan digunakan dengan mengambilkira impak yang paling minima kepada alam sekitar berdasarkan beberapa opsyen.

d. Menyatakan dengan jelas kriteria bagi sumber pasir laut *(sand source)* yang akan digunakan untuk tujuan penambakan laut dari segi kuantiti dan kualiti iaitu jenis pasir, komposisi kandungan kelodakan (*silt content*) (peratusan) bagi memastikan kesan kelodakan yang minimum ke atas ekosistem marin di kawasan persekitaran kawasan penambakan laut.

e. Bagi sumber bahan penambak (pasir laut) yang telah diketahui pembekalnya, nama pembekal pasir laut yang telah dilesenkan oleh Pihak Berkuasa berkenaan dan lokasinya hendaklah dinyatakan. Sekiranya belum diketahui nama pembekal pasir laut yang dilesenkan Pihak Berkuasa, nyatakan lokasi kawasan sumber pasir laut yang dijangka akan diperolehi supaya laluan dari sumber pasir ke tapak cadangan projek dapat dikenalpasti.

(ii) **Pembangunan di atas tanah tambakan bagi Pulau A, B dan C :-**

a. Nyatakan dengan jelas komponen-komponen pembangunan di atas tanah tambakan bagi Pulau A, B dan C yang ditanda sebagai "**mix use**"

b. Nyatakan apakah jenis **industri** yang akan ditempatkan di atas tanah tambakan bagi **Pulau A, B dan C.**

c. Nyatakan berapakah kapasiti peluasan aerodom. (perlu EIA sekiranya 1000 m atau lebih)

PELAN GUNA TANAH DAN PELAN LOKASI

7. Huraian dan penjelasan terperinci berhubung lokasi cadangan projek yang merangkumi:-

(i) Pelan gunatanah terkini yang jelas, terperinci dan lengkap dalam lingkungan 5 km radius (ditunjukkan radius bagi setiap 250m, 500m dan seterusnya) yang jelas menunjukkan setiap '*environmental sensitive receptors*' di sekitarnya dalam saiz A3; dan turut mengambilkira '*environmental sensitive receptors*' yang terlibat.

(ii) Pelan lokasi yang jelas dengan menunjukkan dan menyatakan **jarak di antara lokasi cadangan projek** dengan **kawasan sensitif alam sekitar** dalam **lingkungan sekurang-kurangnya 5 km radius**,. antaranya seperti berikut:-

a. penempatan penduduk;

b. jeti nelayan dan pelabuhan;

c. kawasan pelancongan seperti *chalet, resort*, pantai peranginan;

d. kawasan sensitif alam sekitar seperti koloni rumput laut, kawasan paya bakau persisiran pantai, Taman Negeri, kawasan terumbu karang, kawasan *intertidal mudflat*, habitat marin dan *terrestrial*, paya bakau, kawasan sensitif ekologi dan kawasan-kawasan sensitif alam sekitar perlu dikemukakan.

(iii) Sebarang peta dan gambarajah yang ditunjukkan hendaklah terkini, jelas, lengkap dengan *legend*, ditandakan lokasi projek, tanda arah dan boleh dibaca;

(iv) Peta yang digunakan hendaklah dinyatakan sumbernya yang sah; dan

ALAM SEKITAR SEDIA ADA

8. Kesemua penjelasan mengenai alam sekitar sedia ada dan stesen-stesen persampelan dan pengawasan data garis dasar alam sekitar hendaklah ditunjukkan dengan jelas.

9. Terdapat beberapa sungai di sekitar kawasan tapak projek. Walaubagaimanapun, tidak disebutkan berkenaan kajian yang akan dijalankan untuk melihat isu *backflow* dan banjir kilat. Perjelaskan.

RAMALAN IMPAK

10. TOR perlu dikemaskini dengan memasukkan penemuan penemuan daripada kajian-kajian berikut:-

    (i) Kajian kebolehlayaran, keselamatan pelayaran dan trafik marin; dan

    (ii) SI, TIA

11. Di antara kajian impak isu-isu kritikal yang perlu dikaji dengan terperinci dan komprehensif adalah:-

    (i) **Impak Hidraulik**

    Kajian hidraulik terperinci bagi mengenalpasti kesan hakisan dan pemendapan (*accretion*) yang akan berlaku di sekitar kawasan cadangan projek termasuklah persisiran pantai berdekatan, impak banjir di kawasan muara sungai berdekatan, perubahan kualiti air laut sekiranya tiada *flushing* berlaku di dalam kawasan penambakan dan lain lain impak berkaitan hidraulik dan hidrodinamik. Keputusan kajian hidraulik yang lengkap beserta data-data yang sahih bagi aktiviti penambakan persisiran pantai dan juga penerangan terperinci mengenai cadangan projek hendaklah dikemukakan

kepada JPS dan dinyatakan dengan mengambilkira setiap komponen penambakan yang dinyatakan di dalam dokumen TOR bagi cadangan projek tersebut di atas antara lainnya kaedah-kaedah penambakan yang digunapakai, langkah-langkah kawalan dan pencegahan yang dicadangkan dan kemungkinan berlakunya kegagalan fungsi penambakan dan bencana alam, perlu diambilkira di dalam Laporan EIA Terperinci kelak.

(ii) **Impak kepada Kawasan Sensitif Alam Sekitar dan Ekologi Marin**, antaranya kawasan sensitif alam sekitar seperti koloni rumput laut, kawasan paya bakau persisiran pantai, Taman Negeri, kawasan terumbu karang, kawasan *intertidal mudflat*, habitat marin dan *terrestrial*, paya bakau, kawasan sensitif ekologi dan pendaratan penyu serta lain lain.

(iii) **Impak Kualiti Air**

a. Had pelepasan kumbahan hendaklah merujuk kepada Peraturan-Peraturan Kualiti Alam Sekeliling (Kumbahan) 2009.

b. Kajian kualiti air hendaklah menunjukkan dengan terperinci punca-punca efluen yang dihasilkan dengan menyatakan kuantiti dan kualiti efluen yang dihasilkan, termasuklah *flow rate*, *loading* dan sebagainya.

c. Modelling kualiti air marin yang dijalankan hendaklah menunjukkan dengan jelas impak pelepasan kumbahan ke laut yang dibandingkan dengan *National Marine Water Quality Standards for Malaysia* terbitan Jabatan Alam Sekitar.

d Lokasi takat pelepasan akhir bagi kumbahan hendaklah dinyatakan dan ditunjukkan dalam pelan yang jelas

e. *Kajian sediment plume* hasil daripada aktiviti penambakan bagi menilai kesan kepada ekologi marin.

(iv) Impak Kebolehlayaran, Keselamatan Pelayaran dan Trafik Marin

Ramalan impak kepada kebolehlayaran dan keselamatan pelayaran hendaklah dijalankan secara terperinci melalui *navigation simulation*.*

(v) Impak Bunyi Bising

Kajian bunyi bising hendaklah dijalankan dan berdasarkan kepada garispanduan "*The Planning Guidelines for Environmental Noise Limits and Control*" terbitan Jabatan Alam Sekitar.

(vi) Pengurusan Sisa Pepejal dan Buangan Terjadual

a. Kaedah pengurusan sisa pepejal hendaklah mematuhi kehendak di bawah Akta Pengurusan Sisa Pepejal dan Pembersihan Awam, 2007 di bawah Jabatan Pengurusan Sisa Pepejal Negara.

b. Kaedah pengurusan buangan terjadual hendaklah mematuhi kehendak di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Buangan Terjadual) 2005, Akta Kualiti Alam Sekeliling, 1974.

(vii) Sosio Ekonomi

a. Kajian sosio ekonomi hendaklah melihat kepada kesan kepada industri perikanan, industri pelancongan dan pembangunan ekonomi tempatan menggunakan data yang didapati daripada tinjauan, data sekunder, *Focus Group Discussion* (FGD) dan perjumpaan awam (*public meeting*) dengan *stakeholders* yang berkaitan.

(viii) Kajian *Economic Valuation of the Environmental Impacts*

Kajian *Economic Valuation of the Environmental Impacts* hendaklah dijalankan secara terperinci dan diterjemahkan dalam nilai wang (*monetize*) dan mengikuti "*Guidelines on the Economic Valuation of the Environmental Impacts for EIA Projects*" terbitan Jabatan Alam Sekitar.

LANGKAH KAWALAN

12. Kajian EIA Terperinci perlu mencadangkan langkah langkah kawalan yang efektif dan berkesan bagi menangani impak yang diramalkan, antara lainnya seperti berikut:-

(i) Kesemua langkah kawalan yang dinyatakan di laporan EIA Terperinci hendaklah *project specific* dan terperinci serta perlu dikaji bagi setiap impak kritikal yang dijangkakan;

(ii) Komitmen daripada pemaju untuk memasang langkah langkah kawalan yang berkesan dan terbukti dapat meminimakan impak negatif kepada alam sekeliling, semasa kerja kerja penambakan dan pengerukan penggunaan sumber pasir yang baik dan berkualiti, kaedah penambakan yang mesra alam dan sebagainya; dan

(iii) Sistem pengolahan kumbahan hendaklah dijelaskan dengan terperinci dan spesifik dari segi rekabentuk, keupayaan (*efficiency*) serta jenisnya. Maklumat berkaitan peralatan hendaklah dinyatakan. Had-had pelepasan bagi parameter-parameter kumbahan yang akan dicapai (*discharge standards*) mengikut spesifikasi dan rekabentuk sistem hendaklah dinyatakan.

PELAN PENUTUPAN DAN PEMULIHAN

13. Pelan penutupan dan pemulihan hendaklah dijelaskan sekiranya cadangan projek ini gagal disiapkan, ditamatkan atau telah tamat, bagi setiap peringkat pelaksanaan iaitu sama ada di peringkat penambakan, peringkat pembinaan dan pengoperasian.

EMERGENCY RESPONSE PLAN

14. ERP yang menjelaskan tindakan bagi menangani tumpahan minyak, perlanggaran vesel, kebakaran, letupan dan sebagainya hendaklah dinyatakan di setiap peringkat pelaksanaan projek.

LAIN-LAIN

15. *Metodologi* setiap kajian hendaklah dinyatakan dengan jelas dalam TOR.

16. *Maklumat* dan data yang digunakan di dalam kajian EIA perlulah terkini (*current data*) dan mengambilkira keperluan kajian data-data sepanjang tahun kebelakangan sebagai perbandingan dan sebahagian daripada *modelling* yang dijalankan.

17. Lokasi stesen-stesen pensampelan garisdasar bagi kesemua parameter yang akan dikaji hendaklah ditunjukkan dengan jelas di dalam pelan/peta.

18. Rujukan garispanduan-garispanduan yang berkaitan hendaklah berpandukan garispanduan yang terkini terbitan Jabatan Alam Sekitar dan garispanduan-garispanduan daripada agensi lain yang berkaitan seperti garispanduan berkaitan hidraulik.

19. Jadual Pelaksanaan Projek hendaklah disertakan.

JABATAN ALAM SEKITAR NEGERI TERENGGANU
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24 Mac 2016

Jabatan Alam Sekitar
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Aras 3, Podium 3, Wisma Sumber Asli,
No. 25, Persiaran Perdana, Presint 4,
62574 W.P Putrajaya
(u.p : Bahagian Penilaian, Pn Rohimah Bt Ayub)

Tel : 03-88712000
Fax : 03-88891045

Tuan,

TERM OF REFERENCE FOR THE PROPOSED RECLAMATION AND DREDGING WORKS FOR THE SOUTH RECLAMATION SCHEME (SRS), PENANG
- Sosio Ekonomi

Saya diarah merujuk kepada perkara tersebut di atas dan surat tuan bertarikh **08 Mac 2016** no rujukan surat **JAS 50/013/100/079 JILID 1 (5)** adalah dirujuk.

2. Bersama-sama ini dilampirkan ulasan dari Jabatan Alam Sekitar Negeri Terengganu (Rujuk Lampiran).

Sekian, dimaklumkan.

Terima Kasih

"BERKHIDMAT UNTUK NEGARA"

Saya yang menurut perintah,

(DR ZAINAB BINTI ZUBIR)
b.p.Pengarah
Jabatan Alam Sekitar Negeri Terengganu

LAMPIRAN

BIDANG RUJUKAN (TERMS OF REFERENCE (TOR)) BAGI LAPORAN PENILAIAN KESAN KEPADA ALAM SEKELILING (EIA) TERPERINCI BAGI CADANGAN PROJEK "PROPOSED RECLAMATION AND DREDGING WORKS FOR THE SOUTH RECLAMTAION SCHEME (SRS), PENANG".

ULASAN SOSIO- EKONOMI (DR ZAINAB ZUBIR)

1. Public consultations – perlu diadakan dengan persatuan nelayan dan pengusaha-pengusaha akuakultur.

2. Apakah Langkah-langkah yang dicadangkan akan diambil oleh pemaju projek bagi mengatasi "key environmental issues" di mukasurat 8-3 perkara iii dan iv. Isu-isu ini hendaklah dikenalpasti bagi setiap fasa penambakan, pengerukkan serta fasa pembangunan dan hendaklah dibincang semasa sesi dialog atau "public consultation".

3. Hasil public consultation hendaklah dikaji dan dilaporkan di dalam laporan EIA terperinci bagi mengatasi masalah bantahan penduduk, nelayan dan pengusaha akuakultur semasa projek dijalankan.

4. "Residual impact" bagi "sosio-economy" hendaklah dinyatakan dengan jelas di dalam laporan EIA terperinci.

KEMENTERIAN PERTANIAN DAN INDUSTRI ASAS TANI MALAYSIA
(Department of Fisheries Malaysia)
(Ministry of Agriculture & Agro - Based Industry Malaysia)
PEJABAT PERIKANAN NEGERI PULAU PINANG
JALAN AKUARIUM
11700 GELUGOR
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Ruj. Kami : Prk.PP. 05/76 Jld.5 (30)
Tarikh : 7 April 2016

Ketua Pengarah
Jabatan Alam Sekitar
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No. 25, Persiaran Perdana Presint 4
Pusat Pentadbiran Kerajaan Persekutuan
62574 Putrajaya
(u.p Pn. Rohimah binti Ayub)

Tuan,

MESYUARAT JAWATANKUASA TEKNIKAL BAGI MENGKAJI BIDANG RUJUKAN (*TERMS OF REFERENCE* (TOR)) BAGI LAPORAN PENILAIAN KESAN KEPADA ALAM SEKELILING (EIA) TERPERINCI BAGI CADANGAN PROJEK "PROPOSED RECLAMATION AND DREDGING WORKS FOR THE SOUTH RECLAMATION SCHEME (SRS) PENANG"

Dengan hormatnya perkara di atas dirujuk dan surat tuan JAS 50/013/100/079 Jilid 1(4) bertarikh 8 Mac 2016 adalah berkaitan

2. Berikut merupakan ulasan oleh Jabatan ini terhadap cadangan TOR yang dikemukakan ;

2.1 Kajian perlu mengambil kira jumlah biodiversity (spesis ikan, tumbuhan akuatik) yang dianggarkan akan mengalami kemusnahan kekal;

2.2 Kajian perlu mestilah mengambil kira tukun-tukun yang telah dilabuhkan untuk kemandirian populasi ikan dan mencadangkan satu kawasan yang sesuai utk dilabuhkan semula tukun

2.3 Kajian terhadap usaha nelayan untuk ke laut apabila projek siap dibina kelak. Adakah dalam hal ini terdapat beberapa sekatan (restriction) menangkap ikan dari kawasan pulau apabila siap kelak

2.4 Kepentingan aktiviti akuakultur terutama hatceri pembenihan udang di sekitar Teluk Kumbar dan Gertak Sanggul.

2.5 Berhubung dengan pengusaha akuakultur sangkar ikan laut di Batu Maung , Pulau Jerejak, Sungai Udang seperti;

2.5.1 Kesan perubahan aras arus laut yang akan berubah dan mendatangkan kesan terhadap kelajuan arus, jumlah TSS yang akan hanyut, DO;

2.5.2 Kesan jangkamasa semasa proses penambakkan pulau buatan

2.6 Mencadangkan satu bentuk navigasi pergerakan bot nelayan apabila pulau buatan siap dibina

2.7 Jarak sebenar kawasan penambakan yang terlibat serta kajian jarak terhampir antara perairan Pulau Pinang dan Perak

2.8 Kesan jangkamasa sepanjang penambakan pembinaan pulau buatan kepada pengusaha sangkar

2.9 Mencadangkan alternatif punca ekonomi kepada nelayan yang mengguna sampan dan enjin berkuasa kecil ekoran dari penambakan.

3. Sekian untuk perhatian dan pertimbangan tuan selanjutnya.

Sekian, terima kasih.

"BERKHIDMAT UNTUK NEGARA"

Saya yang menurut perintah,

(ISMAIL BIN IBRAHIM)
b.p Pengarah Perikanan Negeri
PULAU PINANG

s.k Bahagian Perancangan dan Pembangunan
Ibu Pejabat Perikanan

Ruj kami : JPBD/P8/14/17/5/46 – 6( )
Ruj Tuan : JAS 50/013/100/079 jld 1 (4)

4 April 2016
26 Jamadil Akhir 1437 H

Jabatan Alam Sekitar.
Kementerian Sumber Asli Dan Alam Sekitar,
Aras 1-4, Podium 2 & 3, Wisma Sumber Asli,
No 25, Persiaran Perdana, Presint 4,
62574 PUTRAJAYA.

Tuan,

MESYUARAT JAWATANKUASA TEKNIKAL BAGI MENGKAJI BIDANG RUJUKAN (TERM OF REFERENCE (TOR) BAGI LAPORAN PENILAIAN KESAN KEPADA ALAM SEKELILING (EIA) TERPERINCI BAGI CADANGAN PROJEK *"PROPOSED RECLAIMATION AND DREDGING WORKS FOR SOUTH RECLAIMATION SCHEME (SRS), PENANG".*

Dengan segala hormatnya saya merujuk kepada perkara di atas dan surat Tuan bertarikh 8 Mac 2016.

2. Sukacita dimaklumkan bahawa Jabatan **tiada halangan** terhadap bidang rujukan yang dikemukakan dalam Laporan Penilaian Kesan Kepada Alam Sekeliling (EIA) Terperinci Bagi Cadangan Projek *"Proposed Reclaimation And Dredging Works For South Reclaimation Scheme (SRS), Penang".*

3. Dasar Spatial Utama yang terkandung dalam Rancangan Struktur Negeri Pulau Pinang 2020 yang telah diwartakan oleh Kerajaan Negeri Bil 51 No 13 Tambahan No 1 bertarikh 28 Jun 2007 rujukan DSU 8 menyatakan bahawa ***TEBUSGUNA TANAH SEBAGAI ALTERNATIF PENYEDIAAN KAWASAN PEMBANGUNAN BARU AKAN DIHADKAN DI KAWASAN YANG TELAH DIKENALPASTI.***

4. Cadangan projek tebusguna di kawasan selatan Pulau Pinang merupakan salah satu projek tebusguna yang telah dikenalpasti di dalam Rancangan Struktur Negeri Pulau Pinang 2020 (RSNPP 2020) sebagai kawasan Pembesaran Lapangan Terbang.

5. Walau bagaimanapun cadangan penambakan kawasan seluas 4,500 ekar adalah lebih besar daripada cadangan RSNPP 2020, oleh yang demikian, Jabatan telah pun memasukkannya senarai projek ini dalam cadangan **Kajian Semula Rancangan Struktur Negeri Pulau Pinang** yang sedang disediakan selaras dengan perancangan oleh Pihak Kerajaan Negeri.

6. Dimaklumkan juga bahawa mengikut Seksyen 5(2) Akta Perancangan Bandar Dan Desa 1976, Akta 172, Jabatan Perancang Bandar Dan Desa Negeri Pulau Pinang adalah Pihak Berkuasa Perancang Tempatan bagi kawasan tebusguna ini.

Sekian, terima kasih.

"CEKAP, AKAUNTABILITI, TELUS"
"BERKHIDMAT UNTUK NEGARA"

Saya yang menurut perintah,

.....
(MOHD KHAIZAL BIN MAARIP)
Timbalan Pengarah,
b.p. Pengarah,
Jabatan Perancang Bandar dan Desa,
Pulau Pinang.

DSU 8	**TEBUS GUNA TANAH SEBAGAI ALTERNATIF PENYEDIAAN KAWASAN PEMBANGUNAN BARU AKAN DIHADKAN DI KAWASAN YANG TELAH DIKENALPASTI.**
DSU 8	**L 1 -** Tebus guna tanah hanya dibenarkan bagi pembangunan projek – projek yang telah dikenalpasti dan dipersetujui Kerajaan Negeri dan Majlis Perancang Fizikal Negara (MPFN). Ini termasuklah cadangan tebus guna tanah :- • Pesisir Lebuh Raya Bayan Lepas (untuk tujuan pelebaran jalan/ rekreasi awam dan pembinaan Jambatan Kedua); • Pembesaran Lapangan Terbang Antarabangsa Bayan Lepas dan • penempatan setinggan yang terbabit; dan • Muara Sungai Perai – Kuala Juru (untuk tujuan perindustrian).
DSU 8	**L 2 -** Pembangunan tebus guna tanah perlu mematuhi garis panduan ICZM *(Intergrated Coastal Zone Management)*
DSU 8	**L 3 -** Pembangunan tebus guna tanah perlu mematuhi Pelan Pengurusan Pantai Berintegrasi – ISMP yang disediakan oleh JPS. Antara langkah – langkah ISMP *(Intergrated Shoreline Management Plan* adalah :- • Pembaikan (Langkah Jangka Pendek) - Pembinaan Struktur Kawalan Hakisan Pantai; dan - Pembinaan Sistem Pemulihan Pantai. • Pencegahan (Langkah Jangka Panjang) - Perancangan dan Pengurusan Pembangunan Bersepadu; - Mematuhi garis panduan Bil 1/1997 mengenai pembangunan di kawasan pantai; dan - Mematuhi Pelan Pengurusan Persisiran Pantai Bersepadu (ISMP) dengan mengambil kira :- - Ciri dan proses pantai; - Aspek ekonomi, ekologi, alam sekitar; - Keperluan pengguna pantai lain seperti perikanan, pelancongan, - pelabuhan dan lain – lain; dan - Kaedah yang sesuai untuk kawalan hakisan pantai.
DSU 8	**L 4 -** Bentuk kawasan tebusguna sebenar akan ditentukan oleh kajian-kajian terperinci seperti EIA, hidrodinamik, hidrologi dan sebagainya dan perlu mendapat kelulusan Jawatankuasa Perancang Negeri.
DSU 8	**L 5 -** Kajian – kajian tebus guna tanah hendaklah merujuk kepada Kajian Kemungkinan Ke Atas Tebus Guna Tanah bagi Negeri Pulau Pinang oleh Pusat Kajian Samudera Pantai (CEMACS, USM) untuk Kerajaan Negeri yang telah dipersetujui oleh Jawatankuasa Perancang Negeri (JPN) pada 15 Jun, 2004.

DSU 8	**L 6 -** Segera mewartakan kawasan tebus guna tanah kepada pihak berkuasa tempatan bersempadan untuk tujuan pengurusan dan pemantauan pembangunan.
DSU 8	**L 7 -** Mengekal atau menggantikan pantai awam di kawasan pesisir pantai yang ditebus guna melalui pengindahan kawasan, penyediaan kawasan lapang rekreasi, riadah, bersiar dan berkelah
DSU 8	**L 8 -** Mengintegrasikan pembangunan di kawasan tebus guna dengan pembangunan sekitar.
DSU 8	**L 9 -** Memastikan tanah – tanah yang dibenar untuk ditebus guna di bangunkan dahulu sebelum kebenaran merancang diberikan atau pewartaan dilaksanakan.

PEJABAT SETIAUSAHA KERAJAAN NEGERI PULAU PINANG
UNIT PERANCANG EKONOMI NEGERI (UPEN)
PARAS 26, KOMPLEKS TUN ABDUL RAZAK (KOMTAR)
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http://www.penang.gov.my

Ruj. Kami : PSUKPP/03/0554/5/4 Jld. 22 (5)
Tarikh : 22 Jamadiakhir 1437H
31 Mac 2016

Ketua Pengarah Alam Sekitar
Jabatan Alam Sekitar
Kementerian Sumber Asli & Alam Sekitar
Aras 1-4, Podium 2 & 3, Wisma Sumber Asli
No.25, Persiaran Perdana, Presint 4
62574 PUTRAJAYA

ULASAN BIDANG RUJUKAN [*TERMS OF REFERENCE (TOR)*] BAGI LAPORAN PENILAIAN KESAN KEPADA ALAM SEKELILING (EIA) TERPERINCI CADANGAN PROJEK *"PROPOSED BAYAN LEPAS LIGHT RAIL TRANSIT, PENANG"* OLEH KERAJAAN NEGERI PULAU PINANG; DAN CADANGAN PROJEK *"PROPOSED RECLAMATION AND DREDGING WORKS FOR THE SOUTH RECLAMATION SCHEME (SRS), PENANG*

YBhg. Dato' Dr.

Dengan hormatnya perkara di atas dan surat YBhg. Dato' Dr. rujukan : JAS 50/013/603/010 Jilid 1(6) dan; rujukan : JAS 50/013/100/079 Jilid1(4) adalah berkaitan.

2. Ulasan Bidang Rujukan bagi Laporan Penilaian Kesan Kepada Alam Sekeliling (EIA) Terperinci Cadangan Projek *"Proposed Bayan Lepas Light Rail Transit, Penang"* oleh Kerajaan Negeri Pulau Pinang; dan Cadangan Projek *"Proposed Reclamation And Dredging Works For The South Reclamation Scheme (SRS), Penang* adalah dikemukakan secara bersekali seperti berikut:-

> 'Kerajaan Negeri Pulau Pinang telah bersetuju dan meluluskan pelantikan SRS Consortium sebagai *Project Delivery Partner* (PDP) pada 14 Ogos 2015 yang lalu melalui proses tender terbuka. SRS Consortium akan membantu Kerajaan Negeri di dalam proses keseluruhan pelaksanaan setiap komponen di dalam Pelan Induk

Pengangkutan Pulau Pinang mengikut fasa-fasa yang telah ditetapkan dan dipersetujui secara bersama. Fasa pertama pelaksanaan merangkumi penambakan tanah tambak laut di kawasan selatan; pembinaan *Light Rail Transit (LRT)*; dan lebuh raya *Pan Island Link (PIL)*. Pembinaan bagi fasa pertama dianggarkan akan berlangsung selama lapan (8) tahun bermula pada penghujung tahun 2017.

Ketiga-tiga projek mega tersebut merupakan masa depan Negeri Pulau Pinang yang diyakini akan merancakkan lagi pertumbuhan ekonomi di Negeri Pulau Pinang, selain dapat mengurangkan masalah kadar kesesakan lalulintas yang semakin membimbangkan saban hari. Penekanan juga diberikan dalam penggunaan sistem pengangkutan awam dan akan dijadikan sebagai mod pilihan pengangkutan utama apabila disiapkan kelak.

Pembangunan projek tambakan laut ini sangat penting kerana ianya merupakan model perniagaan bagi membiayai keseluruhan projek pelaksanaan fasa pertama. Tiga (3) pulau yang bakal ditambak akan dibangunkan untuk keperluan masa hadapan seperti pembesaran atau peluasan kawasan industri yang berpotensi; menggalakkan pertumbuhan bangunan komersial menggunakan konsep *Transit Development Oriented (TOD);* dan penambahan kawasan pembangunan perumahan mampu milik untuk semua rakyat Pulau Pinang. Pembinaan tiga (3) pulau ini juga dilengkapkan dengan keperluan bandar pintar sesuai dengan keperluan semasa.

Pembinaan LRT adalah harapan semua rakyat Pulau Pinang sejak dahulu lagi. Pembinaan ini akan memberi manfaat langsung kepada seluruh rakyat Pulau Pinang di samping dapat memupuk budaya penggunaan pengangkutan awam pada masa akan datang. Pembinaan PIL adalah perlu bagi memastikan trafik bergerak lancar dari utara hingga ke kawasan selatan Pulau Pinang dan dapat memendekkan waktu perjalanan. Perkara ini semua dilihat mampu menarik perhatian pelabur dan rakyat Pulau Pinang sendiri untuk kembali ke Pulau Pinang untuk berkhidmat.

Kerajaan Negeri menyokong penuh akan pelaksanaan projek ini sekiranya semua peraturan-peraturan dipatuhi terutamanya hasil kajian DEIA ini nanti. Ianya juga bergantung kepada kelulusan daripada pihak Kerajaan Persekutuan terutama di dalam Majlis Fizikal Negara bagi tambakan laut dan SPAD bagi kelulusan sistem rel.'

3. Perhatian dan makluman pihak YBhg. Dato' Dr. berkaitan ulasan ini adalah amat dihargai dan didahului dengan ucapan ribuan terima kasih.

Ruj. Kami : PSUKPP/03/0554/5/4 Jld. 22 (5)
Tarikh : 22 Jamadiakhir 1437H

31 Mac 2016

Sekian.

"CEKAP, AKAUNTABILITI, TELUS"
"BERKHIDMAT UNTUK NEGARA"

Saya yang menurut perintah,

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e.d.: YB Dato' Seri Setiausaha Kerajaan Negeri

Ketua Penolong Setiausaha
Unit Kerajaan Tempatan

ULASAN PROJEK "PROPOSED RECLAMATION AND DREDGING WORKS FOR THE SOUTH RECLAMATION SCHEME(SRS)PENANG

Land reclamation can have negative impacts on marine ecosystems The effects of land reclamation depend on the size, the characteristics and the sensitivity of the areas and on the techniques applied.The majority of construction activity for the Project would be restricted to the marine environment and therefore the potential for impact upon the terrestrial environment is limited.The reclamation and associated activities may cause disturbance to the local water quality, such as through increased suspended sediments in the water. Engine exhaust missions from marine vessels involved in dredging works and engine exhaust emissions from vehicles and site machinery such as excavators, bulldozers and front loaders have the potential to affect local air quality.

The potential environmental were identified as key potential issues:

- increase in water column turbidity
- release of contaminants from dredged material
- damage to terrestrial vegetation
- threatened and migratory species
- introduced marine species
- hydrocarbon spillage
- noise, dust and safety.

Daripada:

Azlindabinti Anwar

Jurutera

JabatanKesihatanNegeriPulau Pinang

Land reclamation can have negative impacts on marine ecosystems
The effects of land reclamation depend on the size, the characteristics and the sensitivity of the areas and on the techniques applied. There is only very limited information available on the actual effects of land reclamation activities on ecosystems and it is therefore difficult to determine how land reclamation affects the overall quality status of the marineenvironment in the OSPARMaritime Area. Some valuable information is available from the EIAs of individual land reclamationprojects. The EIA summary reports (Port of Rotterdam, 2007a and b) of the Maasvlakte 2 project in the Netherlands for example identified various impacts of this project on marine species and habitats including

the permanent loss of protected habitats, significant negative effects on the common tern and black duck, changes in coastal currents, increased noise and reduced air quality (increased NO_2, $SO_2$and PM10 concentrations) during the construction phase as well as adverse effects on benthos organisms and habitats from sand extraction, elevated fine silt concentrations. The reclaimed land will also reduce coastal fishing grounds, mainly for local fishermen.

Land environment

The majority of construction activity for the Project would be restricted to the marine environment and therefore the potential for impact upon the terrestrial environment is limited. The study predicted that given the urban nature of the project area and extent of planned activities, that the effects on terrestrial ecology would be very low or none at all. Water and physical

The reclamation and associated activities may cause disturbance to the local water quality, such as through increased suspended sediments in the water column or pollution through accidental spillages. However, the assessment predicted that following the implementation of best practice measures on site, effects would only be of a minor nature. The study also identified that effects on marine and lagoon ecology will be low. Noise and Air Environment Construction activity has the potential to disturb through the generation of noise. However, the results of the noise study for this Project indicate that noise from the delivery of rock for the sea defence will not result in a significant impact along the transport route. Furthermore, noise disturbance to coastal properties from reclamation machinery will be low and only experienced temporarily. Engine exhaust missions from marine vessels involved in dredging works and engine exhaust emissions from vehicles and site machinery such as excavators, bulldozers and front loaders have the potential to affect local air quality. The main pollutants of concern from these emission sources are likely to be those relating to fuel combustion. However, the assessment for air quality has predicted that the effects would be negligible or minor and of a temporary nature.

Human environment

The Project has the potential to generate positive economic effects to the local and national economy. Positive effects would arise from employment and via the supply chain. In addition, the sharing of international knowledge and expertise with local workers is considered a positive effect of the Project. Predicted impacts on the majority of communities and businesses located near the coastline are anticipated to be of minor significance. Those stakeholders that may be most affected include the Kuramo Business Cabinsand, the
fishermen and shell collectors living in the Oni-Jegi (I) and IgbosereApese communities. In
the operation phase, it is foreseen that these communities and make-shift businesses can
resume normal operation and even benefit from increased tourism. The luxury hotels and
offices on AdetokumboAdemola Street and the businesses on Ahmadu Bello Way are
predicted to benefit significantly from the recl
amation activity in the operation phase as the
real estate value of their properties will increase.

The landscape is defined in this Project as views from the land out to sea. Given the scale
and extent of the Project, it is inevitable that
effects upon the surrounding landscape would be
incurred. The visual effects arising from the presence of the new land would be greatest for
the coastal properties of Victoria Island. Overall, the likely landscape and visual effects arising
from the Project varies from property to proper
ty. However, impacts of this nature should be
considered in reference to the coastal protection value afforded to these properties by the
Project and the relatively low value of landscape character in Lagos.

The potential environmental and socio-economic issues that could arise due to dredging were assessed with reference to the sediment analysis results. The following were identified as key
potential issues:

- increase in water column turbidity
- release of contaminants from dredged material
- acidsulfate soils
- damage to terrestrial vegetation
- threatened and migratory species
- introduced marine species
- hydrocarbon spillage
- noise, dust and safety.

JABATAN ALAM SEKITAR
KEMENTERIAN SUMBER ASLI DAN ALAM SEKITAR
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Tel : 03-88712000

PENGHANTARAN MAKLUMAT KELUAR

NO. FAKS. YANG DIHUBUNGI :

NO. RUJUKAN FAKS : 03-88891045 **(PENILAIAN)**   TARIKH : **15/4/2016**

KEPADA : **Dr. Nik & Associates Sdn. Bhd.** (03 - 4145 8899)

PERKARA : **Ulasan dari Prof Madya Ahmad Mustafa Hashim**
Proposed Reclamation And Dredging Works For The South Reclamation Scheme (SRS) Penang

NO. SALINAN YANG DIHANTAR TERMASUK MUKASURAT INI :

NAMA PENGHANTAR : KATINAH HUSSAIN

RECEPTION
RECEIVED
15 APR 2016
DR. NIK & ASSOCIATES SDN. BHD. (327055-V)

Terms of Reference for Detailed Environmental Impact Assessment (DEIA) for the Proposed Reclamation and Dredging Works for the South Reclamation Scheme (SRS), Penang

Comments on the TOR for DEIA:

1. **Subsection 4.2.1, Page 4-5: Island Concept**

- The island concept was described to maintain access channels having width of 150 to 250 m wide. Need to mention what would be the proposed channel bed level, side slope as well as whether that 150/250 m is bottom width or top width. Considering the existing bed material, the project proponent also need to clarify whether it was assumed sandy material or muddy. This is later to be reflected in the investigation of sediment transport i.e. whether ST or MT (or both) to be used in the hydraulic study accordingly.

2. **Subsection 4.4.2.1, Page 4-9: Dredging of Temporary Access Channel & Subsection 4.4.2.6, Page 4-11: Dredging of Flushing Channel and Channels between Reclaimed Islands**

- To provide estimated volume to be dredged and disposed.
- To specify whether the indicative potential disposal area (Fig. 4.7) is a designated disposal area by Jabatan Laut.

3. **Subsection 4.6.5, Page 4-13: Airport Extension**

- It was mentioned that a proposed extension of the existing Bayan Lepas International Airport will be allocated on Island A. It was not clear whether this will involve extension of the runway etc connecting from the existing Penang Island and Island A. If yes, then this has to be reflected on the layout and the hydraulic study need to account for any adjustment of shape required for this purpose.

4. **Subsection 6.9, Page 6-29: Environmentally Sensitive Areas (ESAs)**

- It was stated with reference to NPP24 (page 2-5 of the TOR) that such coastal reclamation shall not be permitted at areas where there are other sensitive ecosystems such as mangroves, mudflats, coral reefs, turtle landing sites etc. As described in subsections 6.9 and Fig 6.12 in the TOR, at least one of these elements (turtle landing sites) seem to exist within or nearby the proposed project area. How would the above affect the proposed project application?

5. **Subsection 7.1.8, Page 7-13 and 7-14: Hydraulic Study**

- Hydrographic survey need to be included. Its coverage area and other technical details of the proposed hydrographic and topographic survey need to be provided.
- Description of the other oceanographic data such as current flow measurement and water level measurement does not include map showing respective locations. Similarly, need more details for the proposed bed sampling and suspended sediment sampling i.e. numbers of samples and location map.
- The overall hydraulic study need to assess all phases of the project implementation. Since different parcels of each of the three-island development will gradually take shape in a unique way, the impact during development phase need to be addressed accordingly.

6. **Subsection 7.1.8.2, Page 7-16: Task III – Sediment Transport Impact**

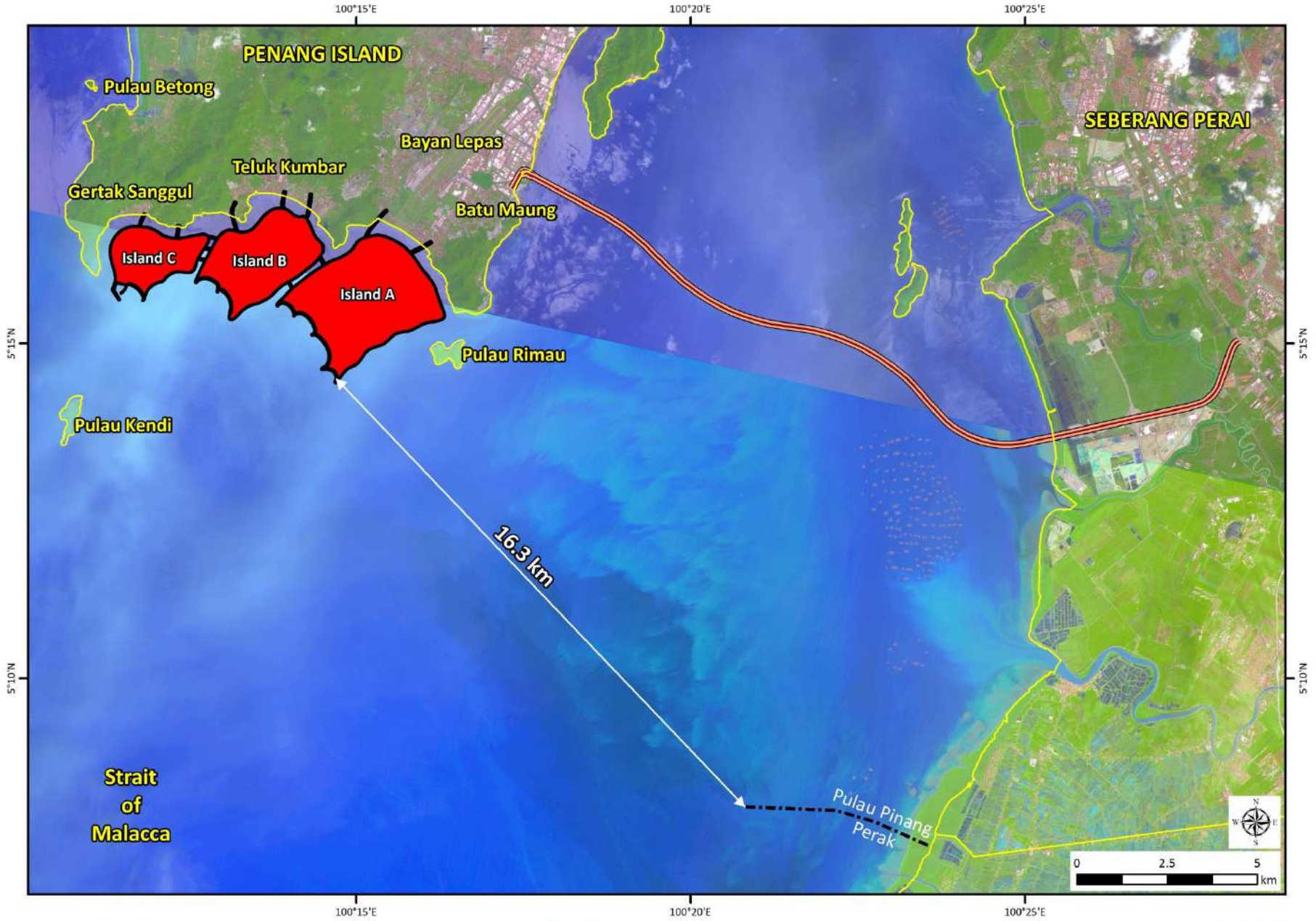
- The use of only MIKE21 MT for the investigation need to be substantiated. The project proponent also need to verify whether there is no necessity to also use MIKE21 ST to address the sediment transport for sandy material (refer to comment no. 1 above).

7. **Subsection 8.3, Page 8-4: Methodology of Impact Assessment**

- The proposed prediction method to assess the coastal erosion and sediment transport not consistent with the earlier description on page 7-16. To ensure the appropriate and relevant method is used based on the prevailing site condition.

Appendix B

Distance from Project Site to Pulau Pinang and Perak Water Boundary



Legend

Jambatan Sultan Abdul Halim Mu'adzam Shah

State Boundary

Project Area

1:130,000

Satellite: SPOT-5

Imagery Date: 02/11/2013

Attachment 2

PAT Approval from DOE Penang
(Ref.:AS(B)P50/013/100/014 Jilid1(6))
dated 28th January 2016

JABATAN ALAM SEKITAR NEGERI PULAU PINANG
ARAS BAWAH - ZON B
WISMA PERSEKUTUAN
SEBERANG PERAI UTARA
13200 KEPALA BATAS
PULAU PINANG

Telefon : 604-575 1911
Faks : 604-575 1455
Website : www.doe.gov.my

Rujukan kami : AS(B)P50/013/100/014
Jilid 1 (6)
Tarikh : 28 Januari 2016

Yang Berhormat Dato' Seri Setiausaha Kerajaan Negeri Pulau Pinang
Pejabat Setiausaha Kerajaan Negeri Pulau Pinang
Tingkat 25, Kompleks Tun Abdul Razak (KOMTAR)
10503 PULAU PINANG

Yang Berhormat Dato' Seri,

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED SOUTH RECLAMATION SCHEME, PENANG
- **Penilaian Awal Tapak (PAT)**

Saya dengan hormatnya diarah merujuk kepada surat jururunding bagi pihak Kerajaan Negeri, Dr. Nik & Associates Sdn. Bhd., no. rujukan DNA/EA/15/078-009 bertarikh 8 Januari 2016 yang diterima pada 13 Januari 2016 berhubung perkara yang tersebut di atas. Perbincangan pada 21 Januari 2016 dan maklumat tambahan yang diterima pada 21 Januari 2016 dan 28 Januari 2016 adalah berkaitan.

2. Setelah meneliti maklumat permohonan yang dikemukakan, berikut adalah ulasan Jabatan Alam Sekitar Pulau Pinang terhadap permohonan tersebut :

(i) cadangan pembangunan THE PROPOSED SOUTH RECLAMATION SCHEME, PENANG adalah tertakluk di bawah Perintah Kualiti Alam Sekeliling (Aktiviti Yang Ditetapkan)(Penilaian Kesan Kepada Alam Sekeliling) 2015 di bawah aktiviti-aktiviti berikut :

a) Aktiviti 7(c), Jadual Kedua – Penebusgunaan bagi pulau buatan manusia;
b) Aktiviti 15(a), Jadual Pertama - Pengorekan induk; dan
c) Aktiviti 15(b), Jadual Pertama - Pelupusan bahan buangan yang dikorek.

(i) Satu Laporan Penilaian Kesan Kepada Alam Sekeliling Terperinci (DEIA) hendaklah dikemukakan kepada Jabatan Alam Sekitar (JAS) Ibu Pejabat, Putrajaya untuk penilaian dan pertimbangan lanjut. Walau bagaimanapun sebelum kajian DEIA dijalankan, Terms Of Reference (TOR) hendaklah disediakan terlebih dahulu untuk persetujuan dan kelulusan JAS. Ditegaskan juga bahawa projek pembangunan tidak boleh dilaksanakan sebelum Laporan DEIA diluluskan oleh Jabatan ini.

3. Selain itu, saya juga ingin menarik perhatian pihak Kerajaan Negeri bahawa, rancangan pemajuan/zon perancangan bagi tapak yang terlibat bagi permohonan tersebut di atas adalah tidak menepati kehendak Seksyen 34A(4) Akta Kualiti Alam Sekeliling 1974 (Pindaan) 2012 kerana tapak cadangan projek tidak selaras dengan rancangan pemajuan/zon perancangan kawasan tebusguna yang diwartakan dalam Rancangan Struktur Negeri Pulau Pinang 2020. Sehubungan dengan ini, adalah dinasihatkan supaya keperluan-keperluan termasuk kelulusan-kelulusan yang berkaitan dengan zon perancangan kawasan tersebut hendaklah diselesaikan terlebih dahulu sebelum Laporan bagi kajian DEIA dikemukakan kepada Jabatan ini.

Sekian terima kasih.

" BERKHIDMAT UNTUK NEGARA "

Saya yang menurut perintah,

(NOR HAYATI BINTI YAHAYA)
Pengarah Alam Sekitar Pulau Pinang

s.k Pengarah Urusan
Dr. Nik & Associates Sdn. Bhd.,
No 22 & 24 Jalan Wangsa Delima 6,
Kuala Lumpur Suburban Centre (KLSC)
Section 5, Pusat Bandar Wangsa Maju
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