

1.0 EXISTING & SURROUNDING LAND USE

1.1 Project Location

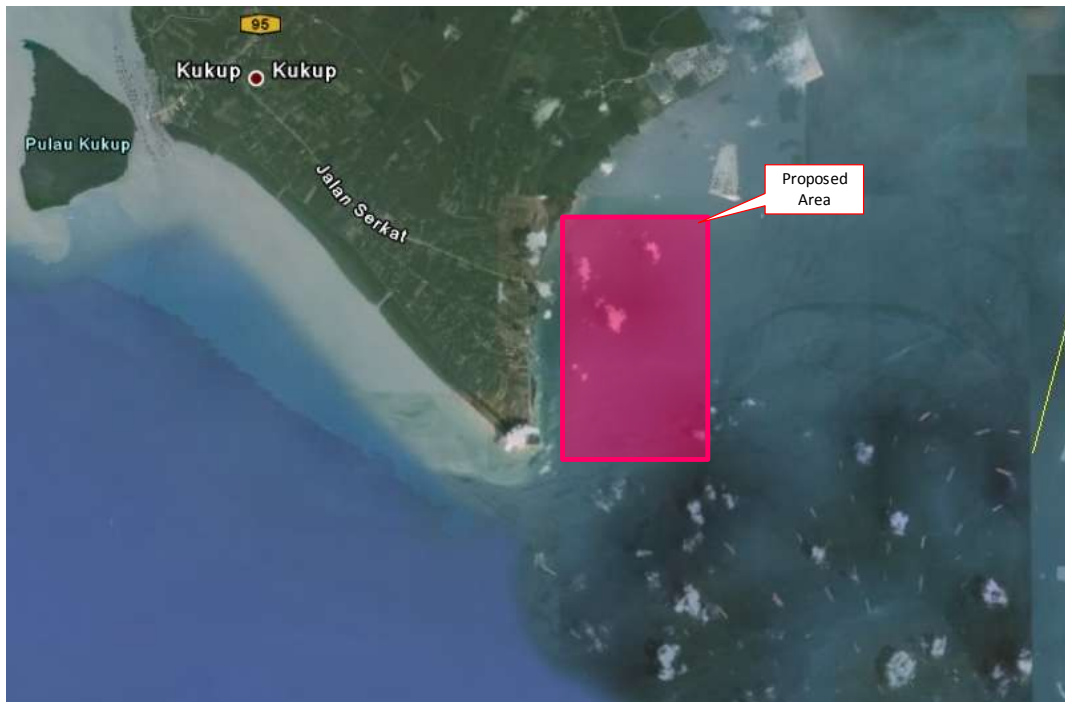
Proposed Project is located at the western part of the State of Johor and the southwest part of Pelabuhan Tanjung Pelepas (PTP) and Tanjung Bin Development. Based on Iskandar Regional Development Comprehensive Development Plan, the proposed project is generally located at Economic Development Zone - Flagship 'C' which within the southwest region of Iskandar Malaysia (Refer Figure 1.1). It is project approximately lies between latitude and longitude of 1°15'49.20"N 103°31'0.32" E 1°19'2.76"N 103°33'9.77" E (Refer Figure 1.2).

Figure 1.1: Project Area within Economic Development Zone - Flagship 'C'



Source: CDP South Johor Economic Region, 2000-2025

Figure 1.2: Project Location Based on Google Earth



Source: Google Earth, 2014

1.2 Existing Land Use

Existing land use of the proposed area is water body (coastal area) of Tanjung Piai. Approximately the distance is 500m located near to mainland of Tanjung Piai. **(Refer Figure 1.3)**

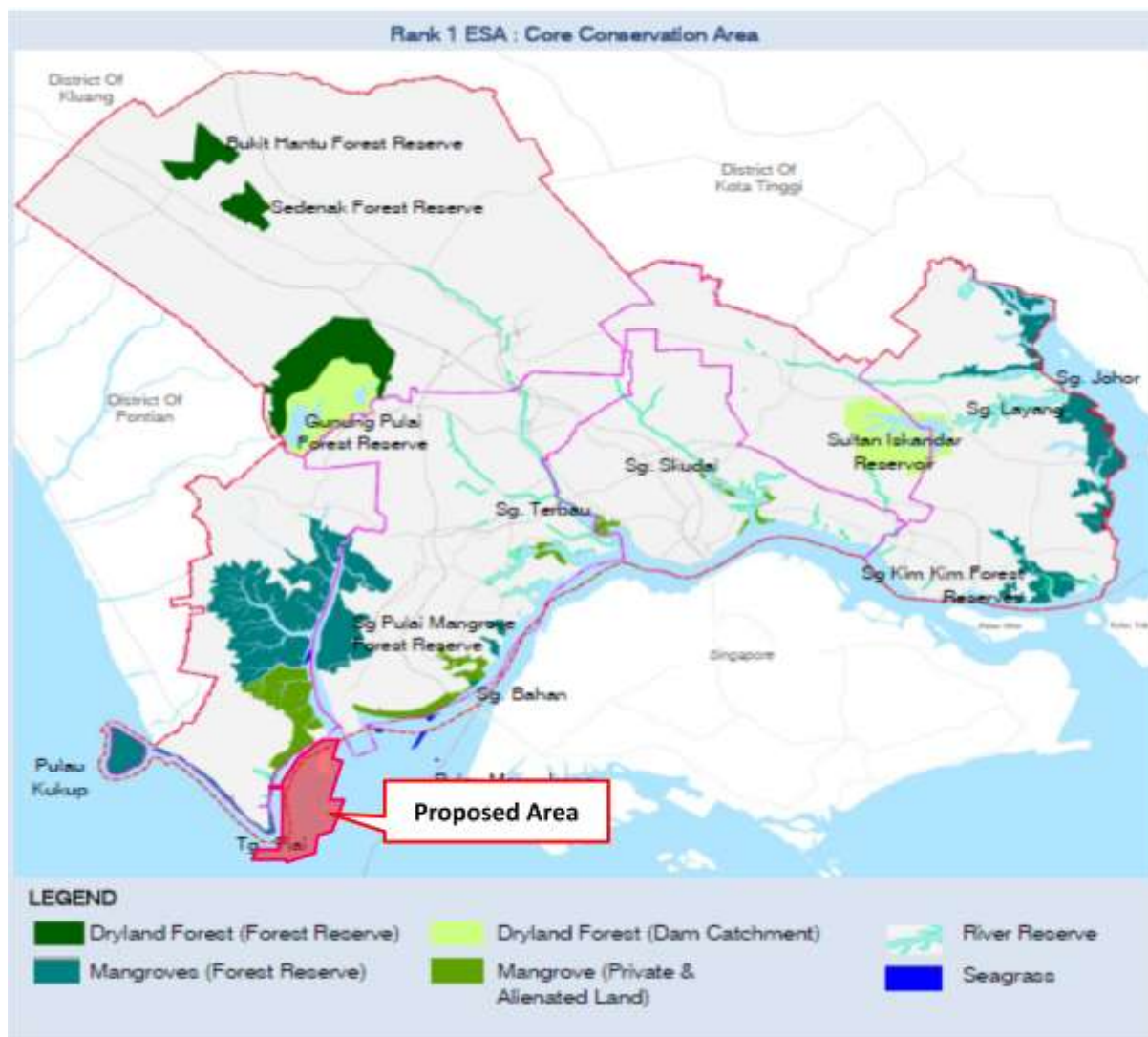
Analysis of existing land use covered an area of 5km radius. Generally, surrounding land use comprises of settlement area, industrial and agricultural land use. The existing most significant land use under industrial categories are Port of Tanjung Pelepas and Tanjung Bin Power Plan.

The Environmentally Sensitive Area (ESASs) is located at the north from proposed site. ESASs means that the areas have a high biodiversity value and perform critical ecosystem functions such as water catchments for dams, nurseries for marine fisheries, etc. The ESASs in the IRDA area are forest reserves, dam and its catchment areas, RAMSAR sites, mangrove areas, river reserves, and catchment for water intake which had stated in the Framework ESASs of Iskandar Malaysia. The ESASs areas require special treatment for the purpose of environmental protection and biodiversity conservation within Iskandar Malaysia. Iskandar Malaysia ranked the ESASs into three categories as follows:

- i. ESAS Rank 1: Core Conservation Area
- ii. ESAS Rank 2: Extended Environmental Consideration Area
- iii. ESAS Rank 3: Contaminated Sites

The surrounding of this development area was considerate as the ESASs Rank 1 (Core Conservation Area) based on the Framework ESASs of Iskandar Malaysia as shows in **Figure 1.3**. Core conservation area is the areas that have high biodiversity value, and/or perform critical ecosystem functions such as water catchments for dams, nurseries for marine fisheries, etc.

Figure 1.3: Framework ESAs of Iskandar Malaysia



Source: Adapted from Integrated Land Use Blueprint a Land Use Growth Management Plan, Iskandar Malaysia, June 09

The detail of ESASs that may affect from the development area is as shows in **Table 1.1.**

Table 1.1: ESASs Area

Site	
RAMSAR sites	1-1) Tg Piai National Park
	1-2) Pulau Kukup National Park
	1-3) Sg. Pulai Forest Reserve
Seagrass Beds	1-8) Sg. Pulai
	1-9) Merambong (including Pulau Merambong)
	1-10) Tanjung Pelepas
	1-11) Tanjung Kupang
Forest Reserves	1-15) Sg. Pendas
	1-16) Sg. Bahan
	1-17) Sg. Kemudi

Source: Jabatan Perhutanan Negeri Johor, 2008
 Buku Panduan Kawasan Sensitif Alam Sekitar Malaysia 1993

The nearest settlement to the proposed site is Kg. Serkat Laut which approximately in 3km to the west. Further the south is the Tg. Piai area which also consists of the ecotourism activities and water. The south from the proposed area is industry which is Jurong Island Chemical Complex and International boundaries between Singapore and Malaysia. The summary of surrounding land use show in **Table 1.2**.

Table 1.2: Description of Surrounding Land Use

Direction from proposed site	Surrounding land use	
	Land use	Development / Area
West	<ul style="list-style-type: none"> • Settlement area • Facilities • Facilities • Facilities • Facilities • Facilities • Tourism area • Tourism area • Facilities • Tourism area 	<ul style="list-style-type: none"> • Settlement area at Serkat Laut • Sek. Keb. Sungai Durian • Masjid Jamek Bandar Permas, Kukup • Sek. Agama Serkat • Kukup Bus Station • Sek. Keb. Seri Sinaran Chokor, Serkat • Jeti Medan Selera Tg. Piai • Tanjung Piai Mangrove • Klinik Kesihatan Serkat • Kukup island
North East	<ul style="list-style-type: none"> • Industry • Housing • Industry 	<ul style="list-style-type: none"> • Integrated Container Terminal at PTP • Pangsapuri Seri Mengkuang, Gelang Patah • Tanjung Pelepas Port
North	<ul style="list-style-type: none"> • Industry • Industry • Forest reserve 	<ul style="list-style-type: none"> • Southern Industry Logistic Cluster (SILC) • Tanjung Bin Power Station • Sungai Pulai Forest Reserve (RAMSAR)
East	<ul style="list-style-type: none"> • Industry • Water body 	<ul style="list-style-type: none"> • Jurong Island Chemical Complex • International boundaries between Singapore and Malaysia
South	<ul style="list-style-type: none"> • Water body 	<ul style="list-style-type: none"> • Coastal area of Tanjung Piai

Source: Perunding UEP Sdn. Bhd, 2014

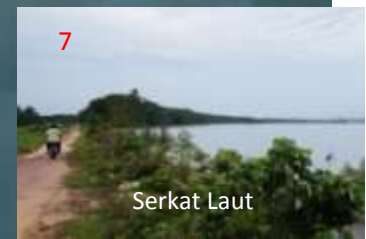
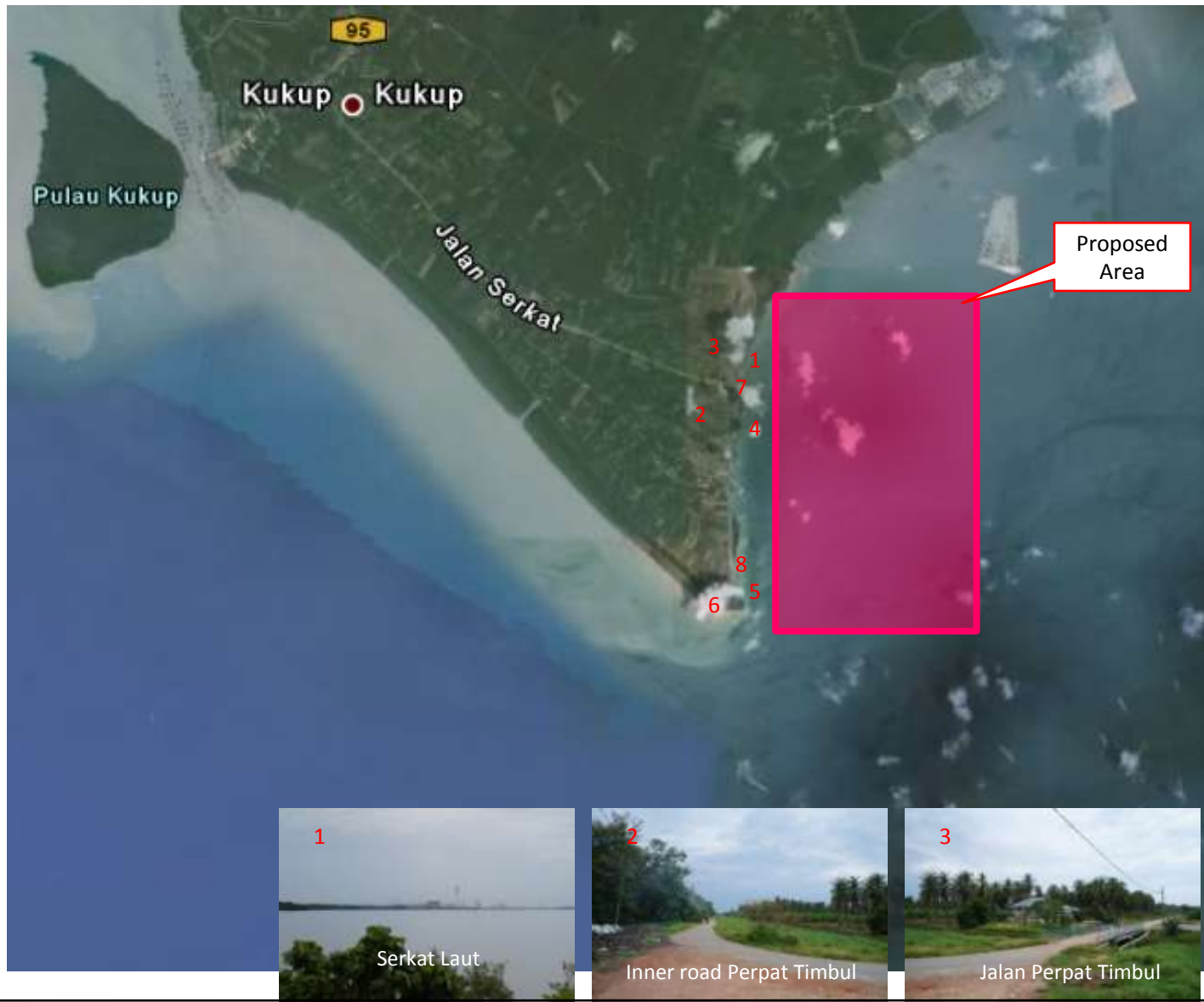



Figure 1.4 :
Existing Land Use Plan

LEGEND:
 Proposed Site

UEP Perunding UEP Sdn. Bhd.
 36A, Jalan Impian Emas 7,
 Taman Impian Emas,
 81300, Skudai, Johor Darul Ta'zim.
 Tel : 07-557 3987 Fax : 07-557 2987
 Email : peruepsb@yahoo.com

Source: Google Earth, 2014

1.3 Land Use Zoning

The project site currently covered by water body. Future zoning at the proposed site does not mention specifically for any development but covered under the water body instead. Both *Draf Rancangan Tempatan Daerah Tempatan Daerah Pontian 2002 – 2015* and *Rancangan Tempatan Daerah Johor Bahru & Daerah Kulaijaya (Pengubahan), 2020* confirmed the above.

Summary of the zoning as below:



Figure 1.5: Land use zoning



Source: *Draft Rancangan Tempatan Daerah Johor Bahru & Daerah Kulaijaya (Pengubahan), 2020* & *Rancangan Tempatan Daerah Pontian 2002 – 2015*



Figure 1.6 :
Surrounding Land Use Plan
(Radius 5km)

LEGEND:
 Proposed Site

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 Taman Impian Emas,
 81300, Skudai, Johor Darul Ta'zim.
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Source: Google Earth, 2014

2.0 LAND USE POLICIES

Proposed site area is reclaimed of sea embankment. Based on site survey conducted, proposed site is located at Straits of Johor. Earthworks would involve topping the sea embankment with suitable fill materials up to the designed platform level. This activity will be extensive as it involves movement of earth from outside the project site. The reclamation will be done in the water body and the surrounding land used will remain. Since the development area was located in the Iskandar Malaysia, refer to the Integrated Land Use Blueprint for Iskandar Malaysia the development needs to be in line with the objective.

Protect and enhance the regions natural environment, urban biodiversity and green network.

The location of project area will be surrounding by the ESASs area which this site is protecting by the some policy and guideline as follows:

- No further development allowed, except for eco-tourism, research, education and reduced impact logging.
- Sites should have adequate legal protection.

3.0 COMMITTED DEVELOPMENT

Committed developments refer to the project that has been approving by the state / federal authorities as well as the existing project that is currently operating at the specific area or surroundings. Some of the major projects that has been committed at the surrounding includes:

- i. Malaysia
 - Port of Tanjung Pelepas
 - Integrated Container Terminal (ICT)
 - Tanjung Bin Power Plant
 - Sungai Pulai Bridge Project (New)
- ii. Singapore
 - Jurong Island Petro - Chemical Complex

3.1 Port of Tanjung Pelepas

PTP's key advantage is a mere 45 minutes from the confluence of the world's busiest shipping lanes which can encourage the **"Petroleum and Petrochemical Hub Maritime Industrial Park"**. PTP's is situated adjacent to the port and terminal and covers an area of about 500 acres. PTP's is easily accessible from the Straits of Malacca, PTP is situated on the eastern side of the mouth of the Pulai River in South-West Johor. PTP is a naturally sheltered deep water port and is near the Malaysia-Singapore Second Crossing.

3.2 Integrated Container Terminal (ICT)

ICT is just 10 km away from either PTP or the Singapore Customs Checkpoint at Tuas and easily accessible via a 2 km diversion from the Second Link Highway. The depot had been specifically designed to meet industrial requirement in terms of location, service offerings, IT system, HSSE and security. ICT's existence and investment in infrastructure facilities are tailored to benefit the market as it is now vital and inevitable for an off dock depot to be operated adjacent to PTP, in line with the Johor's container port rationalisation initiatives. Current area of ICT is 6 acres with additional 4 acres reserved for expansion.

3.3 Tanjung Bin Power Plan

Tanjung Bin Power Sdn Bhd has been granted a licence to construct, with the 2255 acre operate and own a 2,100MW coal-fired power plant in Tanjung Bin, Johor, for a 25-year period, effective from the commercial operation date of the first unit. The power plant comprises three power-generating units, each with a nominal net capacity of 700MW. This industry comprise of light, medium and heavy types of industry.

3.4 Sungai Pulai Bridge

Sg. Pulai Bridge is one of the future development located surrounding of the proposed area with 6.3 km length as show in **Figure 3.1**. Once completion it is expected to give a positive impact to the development.

Figure 3.1: Development of Sg. Pulai Bridge



Source: Google Earth, 2014

3.5 Jurong Island Petro-Chemical Complex

The Singapore Petrochemical Complex is located on Ayer Merbau, which is part of Jurong Island, formed by amalgamation of a group of small islands situated about 3.5 km off the southern shore of Singapore. Singapore is the hub of the high growth Asia Pacific region. It is also a major oil refining, storage and distribution centre, strategically located in the midst of a fast growing oil- and gas-producing region.

4.0 LAND USE COMPATIBILITY ANALYSIS

The objectives of the analysis are as below:-

- Identify natural constraints to development (sensitive land use);
- Identify features that create the land attractive to development (area of influence);
- Incorporating planning tool such as GIS for the analysis of Compatibility for current and future land use; and
- Identify additional incentives and opportunities that would improve and mitigate incompatibility conflicts of land use.

The purpose of the land use compatibility analysis in the preparation of environmental impact assessment is to support the justification on land use changes or policies for the proposed integrated petrochemical/petroleum hub in Tanjung Piai, Johor. It should provide the foundation to minimize any adverse effects from the proposed development sources on any sensitive land uses. In general it is a systematic manner that will provide the project proponent or authorities some support to decide comprehensive land use planning decisions systems to minimize any possible negative impacts of development on the environment. The findings of the analysis will provide the guidance to the project proponent on how the land use compatibility issues should be addressed by preventing any incompatible uses from locating in the same area or identifying any possible land use compatibility conflicts for future developments.

Table 4.1: Land use Compatibility Analysis

Land use type	Analysis
a) River and Water Way	There are several existing rivers (upstream) surrounding proposed project as below:- i. Sg. Seligi ii. Sg. Karang iii. Sg. Boh Kanan iv. Sg. Bhd Kiri v. Sg. Tiram Duku vi. Sg Simpang Gelama vii. Sg. Tiram Duku Kechil viii. Sg. Chengkel kechil ix. Sg. Pulai All the existing rivers are flowing to Straits of Johor. All the rivers crossing are governed by the JPS design requirement except Sungai Pulai which is governing by Jabatan Laut's ship navigation clearance.
b) Sea grass bed and aquaculture	Seagrass beds are present along Sungai Pulai, and at the mouth of Sungai Pulai (Merambong shoal, Tanjung Adang, Tanjung Kupang and Tanjung Bin) and Sungai Lebam. The aquaculture activity are located at mid Sg.Pulai
c)	
d) Settlement	The nearest settlement to the proposed site as below:
e)	i. Kg. Tiram Duku ii. Kg. Pekajang Bengkok iii. Kg. Pekajang Lurus iv. Kg. Ladang v. Kg. Sungai Boh vi. Kg. Sungai Chengkeh vii. Kg Serkat Laut
f) Environmentally Sensitive Area (ESAs)-mangroves	ESAS Rank 1: Core Conservation Area <ul style="list-style-type: none"> • No further development allowed, except for eco-tourism, research, education and reduced impact logging2.

	<ul style="list-style-type: none"> Sites should have adequate legal protection.
g) Neighbourhood / International Boundary Singapore	There are two international borders within 6-7km from the project, namely the Continental Shelf Boundary and the Malaysia-Singapore Border.
h) Industrial Area	<p>Some of the major projects that has been committed at the surrounding includes:</p> <ul style="list-style-type: none"> i. Malaysia <ul style="list-style-type: none"> Port of Tanjung Pelepas Integrated Container Terminal (ICT) Tanjung Bin Power Plant Sungai Pulai Bridge Project (New) ii. Singapore <ul style="list-style-type: none"> Jurong Island Petro - Chemical Complex
Analysis Summary	
<ul style="list-style-type: none"> recommended to be developed on the proposed area need closely monitor due to some of the surrounding activities may affect the ESAS's area safety and health aspect is very crucial 	
Conclusion	
<ul style="list-style-type: none"> The land use compatibility of the proposed development compliment to the existing heavy industries It may reflect the entire area into one of prominent Petroleum and Petrochemical Hub Maritime Industrial Park in this region. 	

Site analysis

The proposed site is located at sea embankment Straits of Johor in an area characterised by industrial development.

Project compatibility with adjacent and nearby land uses

A suitability analysis shows that the site is suitable for the proposed project. The project is compatible with adjacent and nearby uses especially on the industrial demand.

Current and past land use and development on the site

The current land use of the area is a water body. It currently comprises undisturbed water/sea. The land use compatibility of the proposed development compliment to the existing heavy industries such as **Port of Tanjung Pelepas, Tanjung Bin Power Plant and also Jurong petrochemical industry**. With the changes, it may reflect the entire area into one of prominent Petroleum and Petrochemical Hub Maritime Industrial Park in this region. The existing nearby fishing village and aquaculture will convert to vibrant petroleum hub, boost the development of petroleum industry and will benefit to local people. With this changes, it is compatible to the future surrounding area (industrial development-PTP, Tanjung Bin and Sg Pulai Bridge) although the surrounding area have the natural constraints to development (sensitive land use), aquaculture activities, settlement nearby and international boundary.

Table 4.2: Land use Compatibility Analysis Coordinate

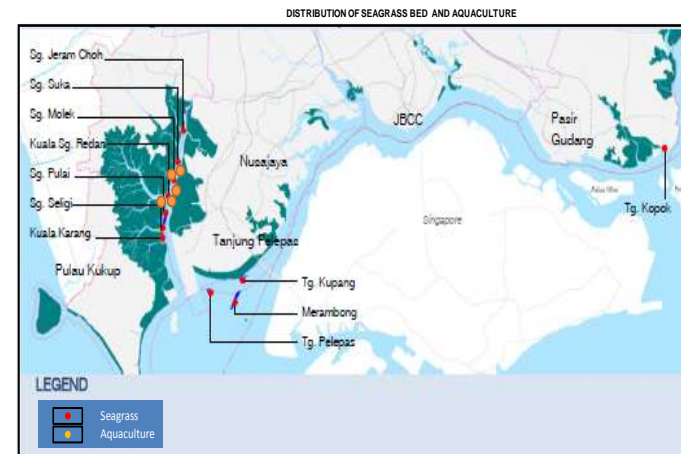
Compatibility	Area	Coordinate
River and Water area	Sg. Boh Kiri	N1° 21' 24.53" E 103° 31' 6.16"
	Sg. Boh Kanan	N1° 21' 31.25" E103° 30' 55.86"
	Sg. Karang	N1° 22' 45.45" E 103° 30' 46.07"
	Sg. Seligi	N1° 23' 15.02" E 103° 31' 43.62"
	Sg. China	N1° 24' 36.55" E 103° 33' 28.79"
	Sg. Tiram Duku	N1° 24' 21.71" E 103° 33' 26.89'
	Sg. Simpang Gelama	N1° 23' 45.58" E 103° 33' 3.64"
	Sg. Tiram Duku Kecil	N1° 23' 37.61" E 103° 32' 29.45"
	Sg. Chengkil Kecil	N1° 21' 22.31" E 103° 31' 56.13"
	Sg. Pulai	N1° 21' 41.29" E 103° 32' 25.93"
Sea Grass and Aquaculture	Tg. Pelepas	N1° 19' 47.40" E 103° 34' 33.78"
	Merambong	N1° 19' 43.28' E 103° 36' 13.99"
	Tg. Kupang	N1° 19' 20' 49.38" E 103° 36' 27.77"
	Kuala Karang	N1° 22' 38.44" E 103° 31' 45.23"
	Sg. Seligi	N1° 22' 47.83" E 103° 31' 42.98"
	Sg. Pulai	N1° 23' 36.19" E 103° 32' 4.47"
	Kuala Sg. Redan	N1° 24' 25.90 E 103° 32' 9.00"
	Sg. Molek	N1° 25' 4.05" E 103° 32' 27.21"
	Sg. Suka	N1° 26' 19.76" E 103° 32' 53.57"
	Sg. Jeram Choh	N1° 27' 16.86" E 103° 33' 11.12'
Settlement	Kg. Sg. Chengkeh	N1° 21' 3.93" E 103° 30' 36.31"
	Kg. Sg. Boh	N1° 21' 41.17" E 103° 29' 43.46"
	Tg. Bin Development	N1° 20' 26.07" E 103° 32' 20.31"
	Pelabuhan Tanjung Pelepas	N1° 22' 1.76" E 103° 33' 3.22'
	Kg. Pekajang Bengkok	N1° 22' 53.20" E 103° 35' 8.22"
	Kg. Pekajang Lurus	N1° 22' 14.25" E 103° 35' 31.60'

	Kg. Ladang	N1° 21' 43.61'' E 103° 36' 37.82''
Environmental Sensitive Area	Tg. Piai National Park	N1° 16' 45.45'' E 103° 30' 29.22''
	Pulau Kukup National Park	N1° 19' 0.75'' E 103° 25' 47.83''
	Sg. Pulai Forest Reserve	N1° 25' 29.59'' E 103° 31' 43.00''
	Sg. Pulai Sea grass Bed	N1° 22' 54.64'' E 103° 32' 15.35''
	Merambong	N1° 18' 42.82'' E 103° 36' 33.92''
	Tg. Pelepas Sea grass Bed	N1° 19' 34.96'' E 103° 34' 23.79''
	Tg. Kupang Sea grass bed	N1° 20' 54.83'' E 103° 36' 34.15''
	Sg. Pendas Mangrove Forest Reserve	N1° 22' 21.17'' E 103° 38' 10.09''
	Sg. Bahan Mangrove Forest Reserve	N1° 23' 42.46'' E 103° 38' 47.71''
	Sg. Kemudi Forest Mangrove Reserve	N1° 24' 24.16'' E 103° 39' 0.59''
Boundary Malaysia - Singapore		N1° 19' 4.94'' E 103° 36' 53.98'
Industrial Area	Senai – Kulai	N1° 39' 5.89'' E 103° 35' 51.39''
	Tebrau	N1° 31' 18.96'' E 103° 45' 48.50''
	Pasir Gudang	N1° 27' 40.26'' E 103° 54' 2.88''
	SILC	N1° 28' 3.83'' E 103° 36' 25.12''
	PTP & Tg. Bin	N1° 20' 53.41'' E 103° 32' 58.55''
	Jurong Island Chemical Complex	N1° 15' 24.38'' E 103° 41' 20.02''
Future Development	Pelabuhan Tanjung Pelepas	N1° 19' 47.40'' E 103° 34' 33.78''
	Tanjung Bin	N1° 20' 26.07'' E 103° 32' 20.31''
	Medidni	N1° 23' 4.97'' E 103° 36' 1.97''
	SILC	N1° 28' 30.11'' E 103° 36' 54.14''

Figure 4.1: Land use Compatibility Analysis)



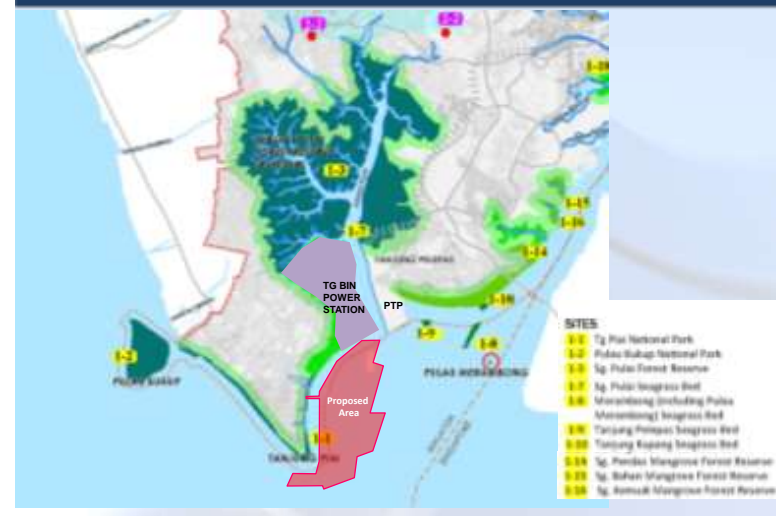
SEAGRASS AND AQUACULTURE



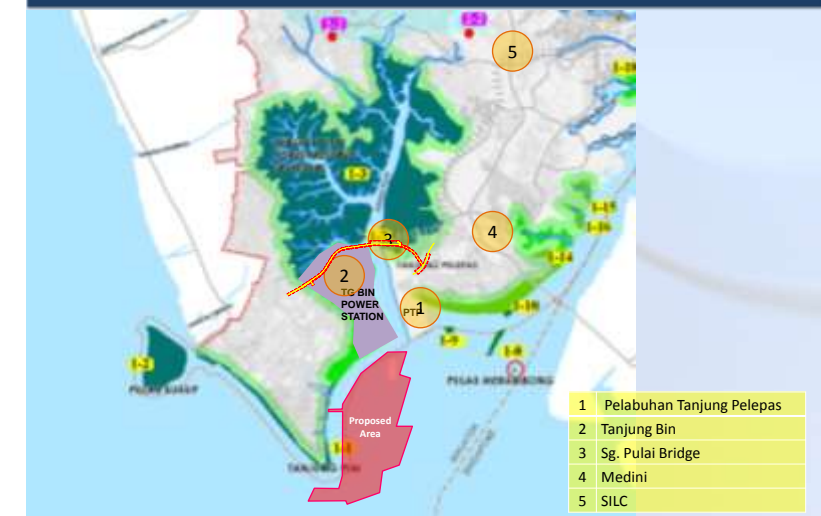
SETTLEMENT



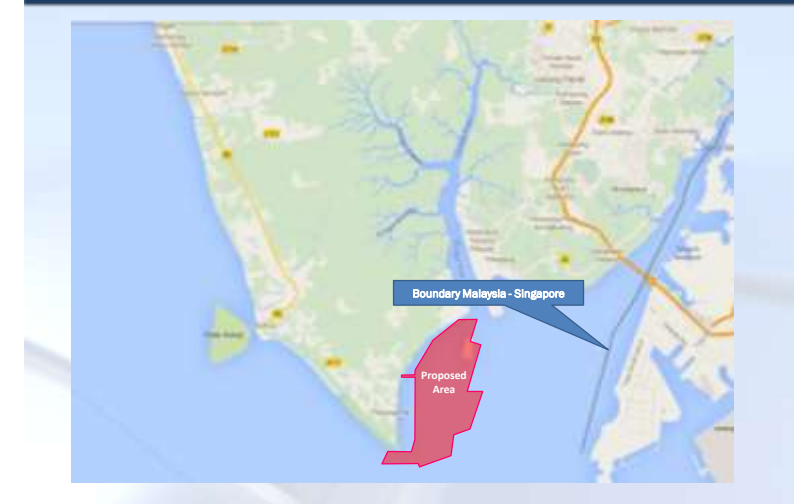
ENVIRONMENTAL SENSITIVE AREA



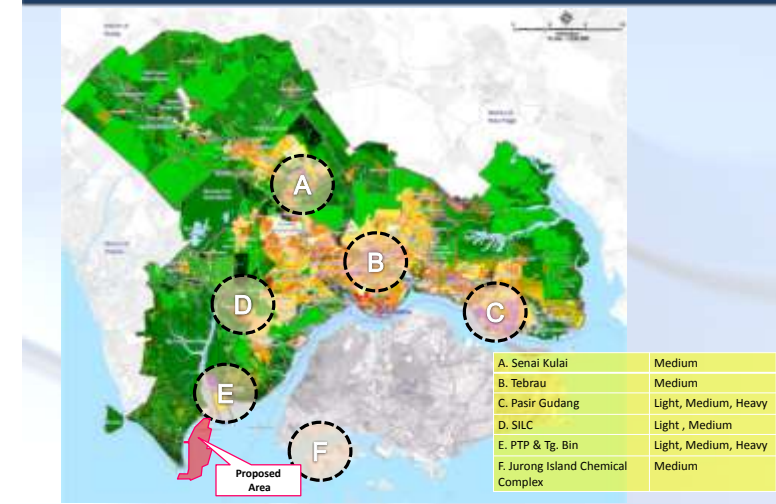
FUTURE DEVELOPMENT



INTERNATIONAL BOUNDARY



INDUSTRIAL AREA



5.0 CONCLUSION AND RECOMMENDATION

The proposed project is recommended to be developed on the proposed area, but its need closely monitor due to some of the surrounding activities that will be affected by the proposed project. Especially during the development process of this project, which may affect the ESAS's area and also the need on safety and health aspect is very crucial. In future, the proposed project will give lots of benefit to the public and state. It will encourage the economic activities of surrounding activities and to the country.

In summary, the positive benefits of the project implementation are large. The negative impacts of the project can all be partly or fully mitigated by the operational strategies. The proposed project is a best way to optimize this area as **Petroleum and Petrochemical Hub Maritime Industrial Park**. As an example to integrated industry, the proposed project can minimize risk of disaster to environment and people. Taking an example of manmade island, Jurong Island, the island is built for petrochemical industry. It is expected that the petrochemical industry will play more role in the future and growth of Johor and Malaysia. The proposed development are also far from the settlement and fishing village.

The land use compatibility of the proposed development compliment to the existing heavy industries such as **Port of Tanjung Pelepas, Tanjung Bin Power Plant and also Jurong petrochemical industry**. With the changes, it may reflect the entire area into one of prominent Petroleum and Petrochemical Hub Maritime Industrial Park in this region. The existing nearby fishing village and aquaculture will convert to vibrant petroleum hub, boost the development of petroleum industry and will benefit to local people.

As a result from this proposed project, it will generate job opportunities and provide jobs to local and improve the lifestyle and socio - economic diversity overall. The proposed project also complements well with other developments of Iskandar Malaysia which overall assists in elevating the status of western gate of Johor. Overall, this proposed project is beneficial towards all aspects in the long term running.

However, in order to ensure fulfilment of the planning standards, the mitigation and recommendations provided below should be considered:-

- i. Based on the changes, the proposed project with all the constraint and with the objective identify the Land Use Zoning Local Plan of proposed site must be review to support the justification on land use changes.
- ii. Surrounding land use must be rezoning to complement the petroleum and heavy industries and preventing any incompatible uses from locating in the same area or identifying any possible land use compatibility conflicts for future developments.
- iii. The policy must be change to strengthen the roll and function.
- iv. The canal as buffer (500m) will reduce the impact for the proposed development to the surrounding.
- v. Other technical analysis must be conduct especially on shoreline, accessibility and engineering aspect.

To the above recommendation, we foresee it may reduce incompatibility of the future land use at the surrounding

2.0 LAND USE POLICIES

Proposed site area is reclaimed of sea embankment. Based on site survey conducted, proposed site is located at Straits of Johor. Earthworks would involve topping the sea embankment with suitable fill materials up to the designed platform level. This activity will be extensive as it involves movement of earth from outside the project site. The reclamation will be done in the water body and the surrounding land used will remain. Since the development area was located in the Iskandar Malaysia, refer to the Integrated Land Use Blueprint for Iskandar Malaysia the development needs to be in line with the objective.

Protect and enhance the regions natural environment, urban biodiversity and green network.

2.1 ESA's

The location of project area will be surrounding by the ESAs area which this site is protecting by the some policy and guideline as follows:

- No further development allowed, except for eco-tourism, research, education and reduced impact logging.
- Sites should have adequate legal protection.
-

2.2 RANCANGAN FIZIKAL ZON PERSISIRAN PANTAI NEGARA (RFZNPPN)

Based on the Rancangan Fizikal Zon Persisiran Pantai Negara (Jilid 1) (RFZPPN6) is as follows:

“PENAMBAKAN LAUT DI ZON PERSISIRAN PANTAI HANYA DIBENARKAN SEKIRANYA DAPAT DIBUKTIKAN BAHAWA MANFAAT EKONOMI YANG DIPEROLEHI DARIPADA AKTIVITI INI JELAS MENGATASI KOS SOSIAL DAN ALAM SEKITAR.”

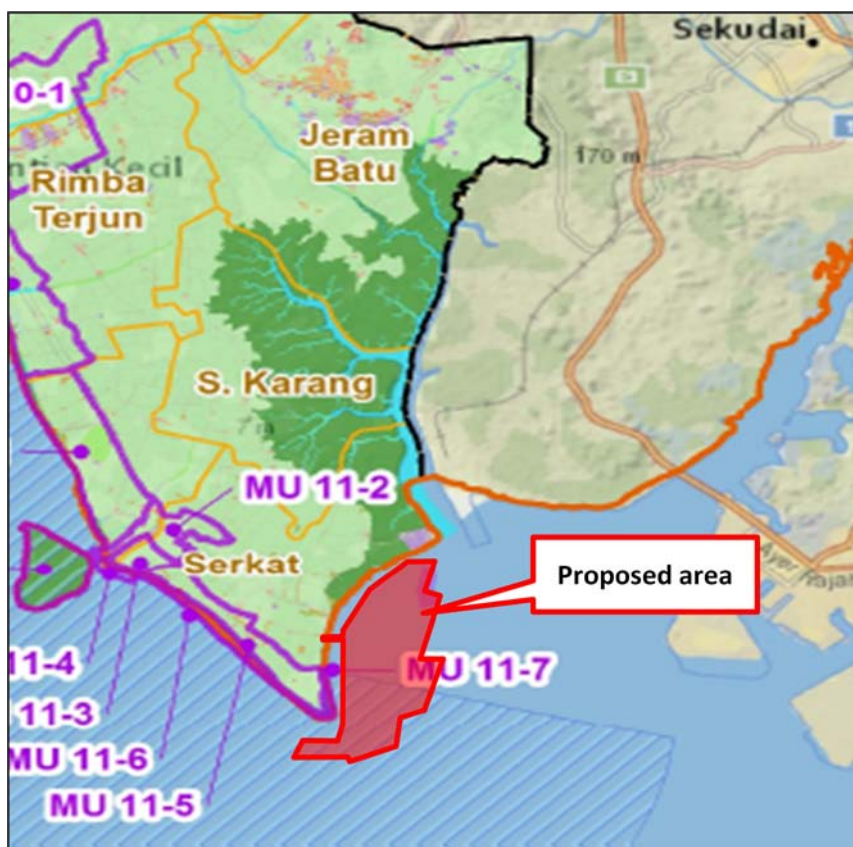
Langkah-langkah:

- i. Semua cadangan penambakan laut perlu dirujuk **kepada Majlis Perancang Fizikal Negara.**
- ii. 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.
- iii. Penambakan laut hanya akan dipertimbangkan dengan syarat-syarat berikut:
 - a. Ia adalah penting untuk mengawal hakisan atau bagi tujuan penambakan pantai, atau mengembalikan tanah yang telah terhakis.
 - b. Tidak akan menjejaskan rejim hidrologi semula jadi persisiran pantai dan proses persisiran pantai.
 - c. Tidak akan menjejaskan kestabilan kawasan projek dan persisiran pantai bersebelahan, termasuk pantai dan kawasan depan persisiran.

- d. Tidak akan menjejaskan habitat semula jadi terutamanya KSASPP Tahap 1 dan Tahap 2 serta perkhidmatan ekosistemnya.
 - e. Faedah projek penambakan laut dalam bentuk pertumbuhan ekonomi dan kebaikan kepada masyarakat nyata sekali melebihi kos sosial dan alam sekitar.
- iv. Semua kerja-kerja penambakan laut yang meliputi keluasan 20 hektar ke atas perlu mendapat kelulusan Laporan Penilaian Kesan Alam Sekitar.

2.3 INTEGRATED SHORELINE MANAGEMENT PLAN (ISWMP)

Figure 2.1: Shoreline boundary from proposed site



Source: Pelan Pengurusan Pesisir Pantai Bersepadu (ISMP) Bagi Pantai Barat Negeri Johor (Sg. Kesang- Tg. Piai), November 2012

The proposed area is excluding from the Mukim Sekat and Tanjung Piai area as shows in **Figure 2.1**, but it is located adjacent of that area. Due to that, the development of the proposed area need to be considered the strategies and some mitigation of that area as shown in **Table 2.1**, **Table 2.2**, and **Table 2.3**.

Table 2.1: Priority, Management Objective and Management Strategies for MU 11-4 Kukup

Priority	Management Objectives	Management Strategies
1	Regulate aquaculture activities	<ul style="list-style-type: none"> • All aquaculture activities should adhere to the <i>Good Aquaculture Practice (GAQP)-Aquaculture Farm-General Guidelines</i> published by the Department of Standards Malaysia. • Regulation is required to ensure sustainability of the aquaculture activities. • Minimizing conflict on usage of the straits for navigation, aquaculture, etc. • Determine appropriate locations and siting for the aquaculture activities. • Determine intensity, density and carrying capacity of the area for aquaculture activities. • Ensure water quality of the straits is suitable for aquaculture activities.
2	Prevent and minimise untreated discharge into coastal waters	Construct a centralised sewerage treatment system linked to all households and commercial entities at Kukup town.
3	Integrated Township Development	<ul style="list-style-type: none"> • A comprehensive development plan that leverage on the strength of the area with potential expansion of tourism activities should be drawn up and implemented to overcome the haphazard development of Kukup town that lacks proper sanitation. • The development should be designated as Special Area Plan.
4	Regulate marine traffic	<ul style="list-style-type: none"> • Guidelines to be prepared to regulate marine vessel traffic within the straits. Vessel movements can be in conflict to the fish cage culture activities within the straits. • The guideline will provide procedure to ensure navigation safety, prevention of oil spills and speed control. • The guidelines shall have legal bearing covering classification of vessel routes and its operation, enforce speed limits and need for traffic separation within Environmentally Sensitive Areas (ESAs).

Source: Source: Pelan Pengurusan PersisirPantai Bersepadu (ISMP) Bagi Pantai Barat Negeri Johor (Sg. Kesang- Tg. Piai), November 2012

Table 2.2: Priority, Management Objective and Management Strategies for MU 11-5 Serkat

Priority	Management Objectives	Management Strategies
1	Improve tourism appeal	<ul style="list-style-type: none"> • The homestay programme has a vast potential market. It was reported that the incoming and transit visitors to another attraction nearby Serkat, Tanjung Piai National Park and Kukup experiences reach 149,000 tourist arrivals annually. Nevertheless, only a small amount of these transit visitors stop-over to pay a visit or stay at the nearby homestays. • Local and overseas promotion and marketing should be made to inform potential visitors of the unique attraction of the homestays. • Dedicated programmes such as experiencing and learning traditional dances, songs, sports, games and cuisines especially from the Bugis culture can be done. This can be done in addition to participating in religious and cultural ceremonies such as weddings, celebrating Hari Raya Aidil Fitri and Hari Raya Aidiladha. • Guided excursions to nearby tourism sites including Tanjung Piai, Kukup, orchards and mangrove forest enable visitors to better appreciate nature. • Development and promotion of Bugis gastronomy, traditional Johor Malay cuisine and seafood restaurants. • Introducing bicycle tourism with proper track is an added attraction to cultural seekers and explorers. • Local Bugis spas can be explored as a unique experience to tap the health-conscious tourist segment.
2	Improving water quality	<ul style="list-style-type: none"> • Discharges from the various plantations shall be regulated to ensure minimum inflow of fertilizers and pesticides into the coastal waters. • Discharges from populated areas shall be treated before discharged into the open waters. • Regular garbage collection should be done to ensure that garbage is not thrown indiscriminately into the river and coastal waters.
3	Education and research	<ul style="list-style-type: none"> • The stable nature of the mangrove forests in MU 11-6 provide a good opportunity to promote research and education with direct linkages with the relevant expertise of the local universities. • Outdoor camping can be promoted for tourists and school children by building camping sites at suitable locations.
4	Opportunity to change profession	<ul style="list-style-type: none"> • Industrial and port development within the surrounding waters has constrained the traditional fishing grounds. • Compensation by the relevant Project proponent is usually one-off. Opportunity and retraining is sought for the affected fishermen to change profession.

Table 2.3: Priority, Management Objective and Management Strategies for MU 11-5 Tanjung Piai

Priority	Management Objectives	Management Strategies
1	Mitigate coastal erosion	<ul style="list-style-type: none"> As much as possible, the protection should enable the coastline to retain its characteristics and promote mangrove regeneration. Offshore submerged breakwaters: create calm wave condition behind the structures inducing coastline stability allowing mangroves to regenerate. Offshore breakwaters can be constructed off the coastline between Kampung Sungai Belukang to Tanjung Piai.
2	Vessel traffic control	Prepare navigational guideline for vessels ranging from speed boats, ferries to container ships plying around Pulau Kukup. The wake created by these vessel movements contribute to the coastal erosion faced by the island.
3	Promote sustainable ecotourism	<ul style="list-style-type: none"> Tanjung Piai's tourism appeal can be further enhanced by improving publicity, infrastructure and accessibility. Visitors' safety should be enhanced by upgrading the walkways and the ancillaries as there are no park officers stationed along the walkways. Apart from printed information provided along the walkway, visitors can also be given the option of guided tours to better appreciate nature. This is especially good for children and young adults to inculcate their interest and educate the importance of wetlands to humans.
4	River and drainage maintenance	<ul style="list-style-type: none"> Desilting is to be done at Sungai Belukang river mouth as well as Parit Hj. A. Ghani and Parit Che Uda outlets facing sedimentation problems to aid navigation of fishing boats and flood water conveyance. The borrow pits or drains located behind the coastal bunds and other unlined channels are to be maintained free from unwanted vegetation and blockage to facilitate flow. The need for tidal gates shall be reviewed periodically and appropriate action taken to ensure that the existing structures are adequate in flow conveyance to reduce flooding risk. Appropriate action can be taken when regular monitoring is done.