ENVIRONMENTAL IMPACT ASSESSMENT FOR PROPOSED DEVELOPMENT OF KUANTAN MARITIME HUB AT MUKIM SUNGAI KARANG, KUANTAN, PAHANG DARUL MAKMUR



Plate 6.4.4: Apartment LPK



Plate 6.4.5: Air Product



Plate 6.4.6: FPG Oleochemical Sdn Bhd



Plate 6.4.7: Kuantan Flour Mill



Plate 6.4.8: TSS Transport Sdn Bhd



Plate 6.4.9: Kuantan Port Authority Building



Land Use Type	Land Use Name / Description	Approximate Distance (km)	Direction
Up to 1 km	-		
Residential	Kampung Selamat	0.1	North
	Apartment LPK	0.1	
	Seberang Balok	0.95	West
	Taman Balok Makmur	0.95	
	Taman Emerald Balok	0.73	
Institution	Sekolah Kebangsaan Balok Baru	0.95	West
Government Office	Pangkalan TLDM	0.9	Northeast
Industrial	TSS Transport Sdn Bhd	0.5	Northeast
	Kuantan Flour Mill	0.7	
	FPG Oleochemical Sdn Bhd	0.6	
Up to 3 km			
Residential	Taman Kasha Villa	1.6	Southwest
	Taman Aisha	1.6	
	Kampung seberang Balok	1.6	
	Taman MH Seberang Balok	1.7	
	Taman Balok Fajar	1.8	
	Taman Wira Jaya	1.8	
	Taman Balok Perdana	2.5	
	Taman Balok Makmur	2.0	
Institution	Institusi Latihan Perindustrian	2.5	West
Amenity	Masjid Balok Makmur	1.4	West
Industrial	Gebeng Industrial Estate	1.4	Northwest
Up to 5 km			
Residential	Taman Putra Perdana	4.2	Southwest
	Perkampungan Balok Baru	4.2	
	Balok Pine	4.2	
	Perkampungan LKAP Balok Baru	4.2	
	Taman Balok Pelangi	4.2	
Amenity	Surau Ka Gebena	5.0	North

Table 6.4.2: Land Uses within 5km from the Proposed Project Boundaries



6.4.4 Future Land Use Around the Proposed Project Site

The proposed Project site is within Mukim Sungai Karang in the District of Kuantan. With reference to the *Pengubahan Rancangan Tempatan Daerah Kuantan* 2010-2015 (the local plan), the proposed site is located adjacent to BPK 3.8 (Pelabuhan Kuantan) and BPK 4.1 (Bukit Pengorak, Kampung Selamat).

JPBD Pahang has verified via its letter referenced Bil.(13)dlm.JPBD/PHG/C1/81/13566 and dated 16 December 2016 (**Appendix 1.2**), that the proposed Project location is suitable to be zoned for industrial application in line with the existing and planned land use at the surrounding area. The zoning of the proposed Project site has been included in the *Draf Rancangan Tempatan Daerah Kuantan* 2035 as shown on **Figure 1.7.1** and the draft local plan is currently being displayed for public review.

In order to ensure that the proposed development within the proposed Project site remain compatible, the arrangement and development planning within the proposed KMH has considered the standard buffer requirement for each of the identified developments as presented on **Figure 6.4.6**.





6.5 Human Environment

6.5.1 Regional Population Profile

The proposed Project site is located in Kuantan District, Pahang. Kuantan with an area of 2,960 km², is divided into six sub-districts comprising a total population of 443,796 (Department of Statistics, 2010). The Project site is located within the sub-district of Sg. Karang with a total population of 54,838. The population of Sg. Karang covers only 12.4% of Kuantan.

6.5.2 Ethnicity, Gender Structure and Household

The dominant ethnic group in Sg. Karang is Malay (87.3%) followed by Chinese (5.3%), non-Malaysian (4.0%), other *bumiputera* (1.8%), Indian (1.2%) and others (0.37%). The total population by ethnic group is tabulated in **Table 6.5.1**.

Ethnic Group	Sub-district: Sg. Karang		District: Kuantan		
	Total	%	Total	%	
Bumiputera (Native)					
Malays	47,855	87.27	333,391	75.12	
Other Bumiputera	969	1.767	4,842	1.09	
Non-Bumiputera					
Chinese	2,917	5.319	75042	16.91	
Indian	681	1.242	13739	3.10	
Others	204	0.372	1400	0.32	
Non-Malaysian	2,212	4.034	15382	3.47	
Total	54,838	100	443,796	100	

Table 6.5.1: Population in Kuantan District and Sg. Karang, 2010

Source: Department of Statistics, 2010

Table 6.5.2 summarises the gender distribution of Kuantan District and Sg. Karang Sub-district. Kuantan has a dominant male population, with a gender ratio of 108 male for every 100 females. At the sub-district level, the gender ratio for Sg. Karang is 116 male to every 100 females. The higher number of male in both Kuantan and Sg. Karang may be due to the industrial nature of employment in the area.

Kuantan District reported a total number of 96,396 households in 2010, of which only 12,031 households reside in the Sg. Karang Sub-district.



Administrative Area	Male	Female	Total	Ratio	Households	Household Size
District: Kuantan	230,648	213,148	443,796	108	96,396	5
Sub-district: Sg. Karang	29,459	25,379	54,838	116	12,031	2

Table 6.5.2: Gender Distribution and Households of Kuanta	an District and Sg. Karang, 2010
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Source: Dept. of Statistics, 2010

6.5.3 Age Structure

Table 6.5.3 provides the age structure of the population of Sg. Karang and Kuantan District in 2010. Approximately 37.44% of the population of Sg. Karang falls into the age group of 15 and below, and is typical of a growing population. The Sub-district has the greatest portion of persons between age 15-64 age group (60.25%) while only 2.32% fall within the age group of 65 year old and above.

The dependency ratio is the ratio of the number of persons falling in the age groups of \leq 15 years and \geq 65 years, compared to the number of persons in the working age group 15-64 years. The dependency ratio for Sg. Karang is 66 per 100 persons.

Age Group	Sub-district: Sg. Karang		District: Kuantan		
	Total	%	Total	%	
0-4	8,507	15.51	45,994	10.36	
5 – 9	6,456	11.77	43,258	9.75	
10 - 14	5,572	10.16	42,869	9.66	
15 – 19	4,665	8.51	49,642	11.19	
20 – 24	4,864	8.87	45,710	10.30	
25 – 29	5,703	10.40	43,537	9.81	
30 – 34	4,840	8.83	32,591	7.34	
35 – 39	3,691	6.73	28,537	6.43	
40 - 44	3,217	5.87	26,049	5.87	
45 – 49	2,347	4.28	24,623	5.55	
50 – 54	1,796	3.28	19,929	4.49	
55 – 59	1,154	2.10	13,795	3.11	
60 - 64	756	1.38	10,568	2.38	
65 – 69	526	0.96	6,575	1.48	
70 – 74	339	0.62	4,855	1.09	
75 and above	405	0.74	5,264	1.19	
Total	54,838	100	443,796	100	

Table 6.5.3: Age Structure within Kuantan and Sg. Karang, 2010

Source: Department of Statistics 2010



6.5.4 Socioeconomic Survey

Socioeconomic survey was carried out on 14-15 March 2017 and 10 April 2017. The survey focused on the residents from the adjacent areas, and some fishermen operating within the proposed Project site. These surveys were carried out in-person using sets of questionnaires. Feedbacks from the interviews were recorded on the individual forms and the data was later computed and evaluated.

Table 6.5.4 shows the distribution of respondents of in the study. About six percent (6%) of the estimated local households from each of the studied residential area and seven percent (7%) of the registered fishing households were interviewed.

Housing Area Covered	Estimated Household	Number of Respondents	Percentage from Estimated Household
LPK Apartment	88	5	6%
Kampung Selamat	100	6	6%
Fishermen	100	7	7%
Total	288	18	

Table 6.5.4: Distribution List of Socioeconomic Survey Respondents

6.5.4.1 Demographic Characteristic

From the 18 respondents, majority (56%) are in the age group of 20 - 34 followed by the age group of 50 - 64 (22%). **Figure 6.5.1** shows the age group of the respondents. Majority of the respondents are male (72%) while female respondents make up to 28%. Most of the respondents are Malay (94%). The majority of them are Malaysian (89%); the rest are foreigners (11%, all Myanmarese). Of these respondents, 67% indicated that they are household heads.



Figure 6.5.1: Respondents' Age Group



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About 39% of the respondents attended secondary schools, mostly up to SPM/MCE level (33%) while the others (34%) attained tertiary education (certificate, diploma, degrees). Some respondents (28%) have only primary education. **Table 6.5.5** tabulates the summary of respondents' education background

Education Level	Percentage (%)
Primary School	28
PMR/SRP	6
SPM/MCE	33
Certificate	6
Diploma	11
Degree	17
Total	100

Table 6.5.5: Education Level of Respondents

Based on the employment distribution (**Figure 6.5.2**), majority of the respondents work in private sectors (39%) and fishermen (39%). Some are working in public sector (5%), and self-employed or owning own business (5%). The others are either pensioners (6%) or unemployed/looking for job (6%).



Figure 6.5.2: Respondents' Employment Distribution



Figure 6.5.3 illustrates that 58% of the respondents shared that their average household incomes are within RM3,000 - RM3,999 income group, followed by those with average household income between RM2,000 and RM2,499 (17%). About 8% of the respondents indicate that their household income is more than RM5,000.



Figure 6.5.3: Respondents' Average Household Income

The survey revealed that 56% of the respondents have stayed more than 10 years in the area. **Figure 6.5.4** illustrates the duration of stay of the respondents. Of these, 56% indicated that they owned the house that they are staying while the remainings informed that they are renting or living at workers' quarters (provided by the employer).







6.5.4.2 Standard of living

6.5.4.2.1 Mode of Transportation

All of the respondents reported that they own their own personal vehicle, either car or motorcycle.

Table 6.5.6: Type of transportation

Types of Transports	Percentage *		
Personal Vehicle	89		
Rented car	11		
Bus	6		

Note: * non-cumulative

6.5.4.2.2 Utilities and Facilities

Most of the respondents (100%) also informed that they have paved roads to their home, and all have access to electricity supply and piped potable water by TNB and JAB, respectively. With the technology advancement nowadays, most household prefer cellphones over land lines. Generally, the interviewed communities have good access to common facilities.

Types of amenities		Percentage (%)
Type of house	Traditional house	44
	Terrace (single)	28
	Flat	28
Water supply	JBA	100
Electric supply	TNB	100
	Cellphone	100
Sewage (Latrine)	Pump flushed latrine	100
Waste disposal	Collected by local council	100

Table 6.5.7: Basic utilities

6.5.4.2.3 Education Facilities

There are primary and secondary schools around the Project area. Reported list of schools is tabulated in **Table 6.5.8**.

Type of School	Name of School
Primary School	Sekolah Rendah Balok Baru
	Sekolah Kebangsaan Pelabuhan
Secondary School	Sekolah Menengah Kebangsaan Pelabuhan

Table 6.5.8: List of School around the Area of Study



Sekolah Menengah Kebangsaan Berserah

6.5.5 Fishing Communities

There is an estimated 100 registered local fishermen in Balok. Although there are also part-time and recreational fishers, their numbers are uncertain. Fishing is an important economic activity among the local communities for generations. Its importance, however, is experiencing a gradual decline which coincide with the increasing industrial activities at the nearby GIE. Based on the interviews with the sampled fishermen, the general traits of local fishing communities can be briefly described as follows:

Sex and age: Local fishermen are likely males (100%), and 30-65 year old of age (86%) as indicated by the survey. Younger replacement of the present fishermen is not encouraging as youngsters generally preferred works outside fishing sector. Many local fishers are either work alone or with family members, and very few, hire paid assistants.

Average household income: Most of the interviewed fishermen (68%) disclosed that their average household incomes are between RM2500-3999 while the others (32%) did not disclosed theirs. Most fishers also indicated that fishing is their sole source of household income.

License and fishing grounds: Most of the local fishermen are Category A licensees and operating in inshore waters (i.e. within 30 nautical miles from shore), using traditional gears such as drift/gill nets, traps and hooks/lines. Sheltered bay which is part of the proposed Project is the most important local fishing area (both as main catch area, and also important source of baits for other fishing gears operating further offshore). As it is sheltered, local fishers can fish in the bay nearly all year round.

Boats and engines: Various boat sizes reported, but all within the ranges of 5-6 feet (width) and 18-31 feet (length), operated using mostly 40 horse-power outboard engines (71%) which is either single or twin engines. Boats are largely made of fibreglass material.

Fishing days and months: Most fishermen go fishing for 14-26 days a month; but most of them fish for 20 days a month (71%). Fishing activities are carried out almost throughout the year although with lesser frequencies during Northeast Monsoon (Nov. - Mar. which is characterized as rainy days and rough seas).

Catch comparison: Most fishers (57%) observed a declining trend in their catch in recent years although others (14%) perceived an increase. About 29% of fishers, however, were not sure of their recent catch trends.

Species caught: Multi-species such as fishes (groupers, *tenggiri, ikan merah, senangin*) shrimps, squids, crabs, shellfishes and stingrays.

Interest in fishing: Survey also indicated that the present fishermen generation is unlikely to encourage their children or grandchildren to involve in fishing. Most of the respondents replied either not sure (57%) or no (43%) when asked whether they want their children or grandchildren to be



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involved in fishing. The reasons probably the availability of employment in other sectors, and also the uncertainties in local fishing sector.

Government assistance: Mostly of the respondents (85%) reported they received fuel subsidy from LKIM; however, when they face any difficulties, they rarely seek assistance from government agency.

Awareness and Perception

The perception, awareness and concerns of the respondents were also gauged during the socioeconomic survey. Generally, the respondents think the existing local environment is good/very good (51%) although some of them perceived it as either less satisfactory (36%) or poor (12%). The prominent environmental concern is air pollution as most of the respondents (73%) perceived the air quality as less satisfactory or poor. This is followed by the concern on flooding (54%), water (45%) and tranquillity (45%). Some respondents had shared multiple concerns.

Most of the respondents (55%) are aware of the proposed Project, only a few claimed that they are unaware of it (45%). Most of those that are aware, claimed that they heard it from friends or relatives. Generally, the local communities are aware of the proposed Project but not clear on what the project is about.

Respondents were asked to specify their concerns with regard to potential environmental impacts from the Project development. About 73% expressed that there may be some environmental concerns while 27% of the respondents are not sure. Those that have raised concerns on the proposed Project development have selected the area of their concerns as presented in **Table 6.5.9**. The respondents expressed multiple concerns associated with the environmental impacts of the Project. Majority of the respondents viewed that changes to fishery resources, fishing area, air quality, local tranquillity and landscape should be of concern.

Areas of concerns	Percentage
Change to fishery resources	100
Change to fishing area	100
Change to air quality	100
Change to local tranquillity	100
Change in landscape	100
Change to water quality	88
Change to community's health and safety risks	88
Job opportunities	88
Competition in getting employment	88
Change to marine traffic navigation	76

 Table 6.5.9: Respondents' Feedback on Environmental Concerns



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Respondents were also asked if the proposed Project would benefit them. Some respondents (46%) think the proposed Project will benefit them while the others are not sure (36%). Only 18% of the respondents indicate that they will not benefit from it.

Table 0.5.10: Respondents reedback on Perceived Benefit of the Project					
% of Feedback from Respondents	Yes	No	Not sure		
Will this project benefit you?	46%	18%	36%		

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The survey also found nearly half of the respondents do not have clear knowledge about the proposed Project, and this explained why half (50%) of the respondents are not able to provide specific and relevant views (Table 6.5.11). Most of those who supported the Project, mentioned of good control measures to be included to prevent deterioration of the general environmental qualities, especially air quality.

Table 6.5.11: Respondents' Overall Feedback on the Project

	% of Feedback fr	om Respondents	
Support	Support with conditions	Object	Not sure
0	50%	0	50%

Concerns of fishing communities

Some concerns raised by local fishermen regarding the possible impacts of the proposed Project on local fishery sector are as follows:

Fishing ground: The proposed Project will physically reduce the size of an important fishing area. Decreasing fishing area could lead to stiffer fishing competition among fishers, over-fishing and unnecessary further degradation of fish resources. As a result, fishermen have to find alternative fishing grounds which are likely located further offshore. However, fishing far from shore would require different strategies which could be costlier and unaffordable to some fishers. These strategies may include bigger boats and engines, and different types or specification of fishing gears.

Sedimentation: Natural sediment dispersion and deposition may be affected by the Project which could result in greater sediment settlement near shoreline and water channels used by locals. Shallow beach and water channel would poise difficulties in accessing the existing fish landing and boat berthing facilities at Balok, especially at low tides.

Water quality: The reclamation works and industrial activities at the reclaimed area will affect local waters, thus fisheries resources. Increased in water turbidity and suspended particulates are likely to affect natural productivity of fishing as well as the existing artificial reefs both directly and indirectly. Sand extraction/ dredging and deposition, and construction work at the reclaimed land will cause disturbance (noise below and above water) which may frighten off fish. Effluent from the Project (at operational stage) and accidental hazardous spillages from ships are likely to affect local water quality in the future.



Focus Group Discussion 6.5.6

Focus group discussion (FGD) aims to brief the relevant stakeholders of the proposed Project, explaining the scale of construction and operation as well as the purpose of the EIA assessment. The FGD session also helps to gauge the awareness and acceptance of the proposed Project and to clarify any unclear or lack of information on the Project. In addition, the Proponent has viewed the dialogue session as an opportunity to establish the communication network with the relevant stakeholders.

It was identified that the relevant stakeholders were the port operators as well as the fishermen group near the proposed Project site. Two FGD sessions were carried out. The first FGD was held on 3rd March 2017 at Kuantan Port with Lembaga Pelabuhan Kuantan (LPK) and Kuantan Port Consortium Sdn Bhd (KPC), the port operator as well as DOE Gebeng; while second FGD was held on 14th April 2017 at LKIM Kuantan with the officers of LKIM, representatives of fishermen leaders and the community leaders of the area. Presentation slides, notes of meeting and comments by attendees are attached in Appendix 6.4.

Name/ Agency	Feedbacks	Cross Reference In EIA Report
Lembaga Pelabuhan Kuantan	LPK welcomed the proposed development. Saw synergy with Kuantan Port and few new projects in the area.	Figure 6.6.8 shows Project site is within port limit.
(LPK)	operation permitting requirement.	
Kuantan Port	KPC noted on Project's dedicated navigation channel does not cross port's navigation channel and anchorage areas.	Refer Figure 1.4.1a.
Consortium Sdn Bhd (KPC)	Section 6.6.1 and Appendix 6.5	
	Ensure enough parking space within project area to avoid illegal parking along road side and cause traffic congestion on the public road.	Parking lots are included in development plans as shown on Figure 5.2.2 to 5.2.4
	Stormwater management – flooding at upstream of Sungai Pengorak and along Federal Route 2 near Kg Selamat to Kuantan Port. Water cannot flow out during high tides and heavy rain events. Consider improvement of drainage along the road and upstream of Sungai Pengorak.	Section 7.2.3.5 and Section 8.2.3
	Buffer zone from project to LPK Apartment. Chemsain informed that based on local plan, the LPK apartments are zoned as "kemudahan masyarakat" and next to industrial	Section 6.4.4

The feedbacks gathered during these FGD sessions are summarised below



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Name/ Agency	Feedbacks	Cross Reference In EIA Report
	testing.	described in Section
	Sand blasting and spray painting should be enclosed. Knowledgeable that spray paint can disperse and stick on public vehicle nearby.	5.3.2
Jabatan Alam	Include information on sand source and disposal site for dredged material in EIA report.	Section 5.3.1.1.1 and Figure 5.3.1
Sekitar, Cawangan Gebeng	Shared that Sg Pengorak receives discharges of bauxites stockpiles area and quarries.	Noted
(DOE)	Suggest to indicate the category of the planned maritime industrial park as light and medium industries type.	Detached and semi- detached factory lots are planned for the industrial park (section 5.2).
Lembaga Kemajuan	It was indicated that the proposed project area is near common coastal fishing areas.	Section 6.5.5
lkan Malaysia (LKIM) Pahang	Suggested that the consultant and project proponent follow up with local fishermen and villagers to gauge views and opinion on proposed development and expectations.	
Fishermen Leaders	Fishermen were generally concern that reclamation and dredging works will disrupt their usual fishing areas. Fishermen mentioned compensation is required if project affects their fishing locations and activities.	Section 6.5.5 and Section 7.6.3.1
	Fishermen shared that previously they only get RM20,000 compensation whereas their income is RM100,000 in that same location.	Reference was made to offshore sand consession area.
	It was confirmed that there were two <i>tukun</i> (artificial reef) launched by LKIM near the proposed project site. These are breeding ground for fish and should not be disturbed.	Navigation channel is located outside the <i>tukun</i> locations, Figure 6.4.1.
	Fishermen leaders suggested that follow up with local fishermen to gauge views and opinion on proposed development and expectations.	Section 6.5.5
Community Leaders	JKKK Kampung Baru shared that the waters near the project location (near Balok) are quite shallow which extends up to half mile after the shoreline. The reclamation will cause some erosion elsewhere, and also cause water pollution. Generally, concern if project may cause erosion to village near Sg Balok.	Section 7.2.3 and section 8.2
	No specific concern on Sg Pengorak as it only contains swamps and upstream have been blocked off after the development of Kuantan Port. No specific fishing activities there.	Section 7.2.3 and section 8.2
	If fishermen need to travel more than 70 km for productive fishing, the committee requested for a proper impact assessment on fishermen especially those with smaller boats.	Section 6.5.5 and Section 7.6.3.1
	Assumed the proposed maritime hub is like Kuantan Port which means port limit where fishermen are not permitted to	Project site is within existing port limit.

Name/ Agency	Feedbacks	Cross Reference In EIA Report
	fish. Claimed that there is a fishing pond near the project site along the coastal area.	No fishing pond is found along the coast of Project site.
	Concern over road traffic impact along Jalan Tanjung Gelang.	Section 6.6.1
	Suggested to have a copy of EIA report at Penghulu office for public review.	Informed DOE office.

6.6 Infrastructure and Utilities

6.6.1 Road Traffic

A Traffic impact Assessment (TIA) study for the development and operation of Phase 1 to gauge the impact of the development to the surrounding existing road network and aid in the planning of development schedule. The TIA report is appended as **Appendix 6.5**.

6.6.1.1 Existing Road Network

External trips to/from the proposed development will come from or go to major zones identified as follows:

- 1. Kuantan and Kemaman through Kuantan Bypass (FT2/FT3 link road).
- 2. Balok and Kuantan through Federal Trunk Route 2 (FT2).
- 3. Link road of FT2 and FT3.
- 4. Kuantan Port, Gebeng and Kemaman through FT3.
- 5. Kuantan Port, Gebeng and Navy Base through Jalan Kuantan.
- 6. Navy Base through Federal Route 435 (Jalan Tanjung Gelang).
- 7. Navy Base through un-named road.

8. Kuantan Port, Gebeng and Kemaman through Bukit Pengorak, Jalan Pelabuhan and FT3

Table 6.6.1: Road	d Inventory
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Location on map	Road	Carriageway Type	No. of Lanes	Lane Width (m)	Shoulder Width (m)
1	FT2 before EJ1 from Balok	Dual 2-lane carriageway	2 x 2	3.50	>2
2	FT3 before link road to EJ1	Dual 2-lane carriageway	2 x 2	3.50	>2
3	FT2/FT3 link road	Dual 2-lane carriageway	2 x 2	3.50	>2
4	FT3 after link road to EJ1	Dual 2-lane carriageway	2 x 2	3.50	>2
5	Jalan Kuantan until EJ2b	Multilane carriageway	2 x 2	3.50	>2



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Location on map	Road	Carriageway Type	No. of Lanes	Lane Width (m)	Shoulder Width (m)
6	FR435: Jalan Tanjung Gelang	Single 1-lane carriageway	1 x1	3.25	< 1.8
Not indicated	Road to Kg Selamat	Single 1-lane carriageway	1 x1	3.00	<1.8
8	Road through Bukit Pengorak	Dual 2-lane carriageway	2 x 2	3.50	>2
5	Jalan Kuantan after EJ2b	Single 1-lane carriageway	1 x 1	3.25	> 1.8
7	Un-named road to Navy Base	Single 1-lane carriageway	1 x1	3.25	< 1.8





Figure 6.6.1: Local road network and major junctions for the study area.

Federal Route 2 (FT2) – Jalan Kuantan – FT435 (Jalan Tanjung Gelang) serve as the backbone of accessibility to all destinations for the proposed development. Observe geometric standards of these roads and highways are as follows:

- Federal Route 2 (FT2) dual 2 lane of JKR R5 standard
- Link road of FT2 and FT3 dual 2 lane of JKR R5 standard
- Jalan Kuantan partially dual 2-lane and single 1-lane carriageway of JKR R5 standard
- FT435 (Jalan Tanjung Gelang) single 1 lane carriageway of JKR R3 standard
- Un-named road to Jalan Kampung Selamat single 1 lane of JKR R3 standard
- Un-named road through Bukit Pengorak dual 2-lane of JKR R5 standard
- Un-named road to navy base off junction with road through Bukit Pengorak single 1 lane of JKR R3 standard

The existing development site is well connected to the existing roads and highways through the following access junctions:







Figure 6.6.2: Access junctions of proposed Kuantan Maritime Hub

EJ1 and EJ2b are signalized T-junction while EJ2a and EJ3 are unsignalized T-junction serving as the external access.



6.6.1.2 Existing Traffic

Current peak hour traffic volumes on the roads within the study area were determined from classified manual traffic counts. These counts were conducted on a weekday on February 2017 for the morning and evening peak hour periods, i.e. 7.00 am to 10.00 am and 4.00 pm to 7.00 pm respectively.

Classified traffic movements were conducted at 4 strategically at selected stations in the study area. The 4 strategic locations are:

- Station EJ1 Signalised T-junction of FT2/Jalan Kuantan and link road to FT3
- Station EJ2a Unsignalised T-junction of Jalan Kuantan and road to Kampung Selamat
- Station EJ2b Signalised T-junction of Jalan Kuantan and Jalan Tanjung Gelang (FR435)
- Station EJ3 Jalan Kuantan/Road through Bukit Pengorak/Un-named road to Navy Base

From the traffic survey, the following conclusion was made of the peak hours:

AM peak hour - 7:00 am to 8:00 am

PM peak hour - 4:30 pm to 5:30 pm

It was observed that the morning peak traffic volume is heavier by 36% as compared to the evening peak hour traffic volume.

All of these roads and highways particularly the local roads are operating way below the design road capacity. It could be observed that currently, during the peak hour, the road network surrounding the proposed development has relatively low volumes, thus resulting in a high level of service on the local road network. This indicates a high level of driving comfort with minimum traffic congestion.



Figure 6.6.3: Results of link and junction capacity analysis 2017



6.6.1.3 Forecast of Project Generated Traffic

The proposed development, when completed, would inevitably result in additional trips generated onto the surrounding road network. To assess the traffic impact of the proposed development, it is necessary to:

- Project the normal traffic growth of the surrounding road network;
- Evaluate the trips generated by the proposed development and its neighbours;
- Evaluate the traffic impact of the trips generated by the proposed development and its neighbours onto the surrounding road network.

Normal Traffic Growth

Table 6.6.2 shows the annual growth rate (AGR) obtained from the historical data of year 2004 to 2014 of traffic count stations along the major roads in District of Kuantan.

Station No.	Route No.	AGR
409	2	4.06%
410	3	4.04%
Average		4.1%

Table 6.6.2: Annual traffic growth rates at HPU Stations in Kuantan

Source: Road Traffic Volume, Malaysia, 2014, Highway Planning Unit (HPU), Malaysia

The historical data indicates that the annual traffic growth rate in the study area is averaged at 4.1%. We reckon that as the study area will have has a high potential growth in the future, so a moderate AGR of 4.1% for years 2014 to date and these will take into consideration the traffic growth from the potential neighbouring developments.

Peak Hour Trips Generated by Proposed Development

The proposed development mainly comprises residential, commercial, industrial and institutional units. For the purpose of peak hour trip generation, although we will be focussing on AM peak hour traffic, however we will also conduct the PM peak hour traffic as a control measures.

Using the Trip Generation Manual 2010 by HPU, Malaysia, the peak hour traffic attracted (in) and produced (out) by the proposed development are computed as shown in **Table 6.6.3**.

Land Use					Generated Trip in vph			
Phase	Туре	Area	Percentage of	A	АМ		РМ	
		(Acre)	Development	In	Out	In	Out	
1a	Shipyard	60	50%	98	29	25	64	
1b	Shipyard	30	25%	147	44	37	96	
	Fabrication yard	100	50%	193	58	49	126	
	Maritime Industrial Park	90	50%	122	63	51	90	
	Technical Training Institutes			600	123	146	296	
	Business			636	169	171	464	
	Residential Park			64	183	151	101	
1c	Shipyard	30	25%	147	44	37	96	
	Fabrication yard	100	50%	193	58	49	126	
	Maritime Industrial Park	90	50%	122	63	51	90	
	Technical Training Institutes			600	123	146	296	
	Business			636	169	171	464	
	Residential Park			64	183	151	101	
	Total and Average	500	100%	3624	1308	1235	2409	

Table 6.6.3: Peak hour trip generation

Vph: vehicle per hour

The AM peak hour traffic is 35% higher than the PM peak hour and this is consistent the current traffic trend.

Traffic Impact of the Proposed Development

Assumption was made that the proposed development shall be completed and occupied by year 2020 and the scenario 10 years from then has be analysed. Hence, combining traffic from the prevailing year 2017 and the trip generation and distribution model in the preceding sections, a traffic projection exercise 2027 were carried out. The traffic impact of the proposed development shall be evaluated for the surrounding road network. Details of projections can be referred in **Section 4.4.1** and **4.4.2** of the TIA report **in Appendix 6.5**.

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Figure 6.6.4: Junctions and Links LoS for with Phase 1A



Figure 6.6.5: Junctions and Links LOS for with Phase 1B

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Figure 6.6.6: Junstions and Links LoS for with Phase 1C

Based on the results that had been presented, the following observations can be made:

- With Phase 1A traffic, existing roads and junctions can accommodate the future traffic demand satisfactorily
- With Phase 1B traffic, existing junction connecting Kuantan port to Kampung Selamat has to be upgraded as signalised junction and additional right turn lane to FR435 Jalan Tanjung Gelang at existing junction has to be upgraded to avoid congestion.
- With Phase 1C traffic, access junction connecting Jalan Kuantan-Kemaman to Jalan Kuantan has to be upgraded and the junctions accessing the Project site need to be further upgrade. Jalan Tanjung Gelang will be operating satisfactorily with minor adjustment.

6.6.2 Marine Traffic

The proposed Project site is located south of Kuantan Port. As the proposed Project is expected to generate some marine traffic during the construction and operation stages, the existing marine traffic sources and volume as well as the future anticipated marine traffic are discussed below.

6.6.2.1 Existing Port Facility

Kuantan Port, located at 3° 58'N, 103° 26'E, is a multipurpose port serving Kuantan and the east coast region. It commenced full operation in 1984 and was previously run by the Kuantan Port Authority. The port has been privatised since 1998 and is currently operated by Kuantan Port Consortium Sdn Bhd.

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The existing port operates all year round and has the capable of handling vessels up to 40,000 DWT and various types of cargo ranging from general cargo, dry bulk to liquid bulk. The port also functions as centralised tankage facilities with pipeline and pipe rack system connecting Gebeng area to Kuantan Port. In addition, the port has positioned itself as a regional centre for transhipment activities as well as cargo consolidation and distribution activities. Kuantan Port is also equipped with facilities and services to meet the specific requirements of the petrochemical industries, among the largest industrial activities at Gebeng industrial park. Presently, Kuantan Port has 22 berths, which includes 8 berths for liquid cargo, 3 container berths and 11 dry bulk berths.

Kuantan Port is expanding its facility with the new deep water terminal which will be able to receive vessels up to 200,000 DWT and the port will have the capacity to handle up to 52 million freight tonnes of cargo. The initial development phase of the deep water terminal is expected to be ready for operation by June 2018.



Figure 6.6.7: Layout of the Existing Kuantan Port and Proposed Deep Water Terminal. (Source: http://www.kuantanport.com.my)

6.6.2.2 Existing Navigation System

The Merchant Shipping Ordinance 1952 has gazetted the water area as port limit for Kuantan Port as shown on **Figure 6.6.8**. The port limit extends to the estuary of Sg. Kuantan on the southern



boundary. There are designated anchorage areas along the navigation channel and navigation aids to Kuantan Port.



Figure 6.6.8: Kuantan Port Limit

Figure 1.4.1a is a Project location map which shows that the proposed Project site is located within this port limit. The proposed area to be reclaimed and the proposed Project's navigation channel are located outside the designated anchorage areas and existing navigation channel for Kuantan Port.

As such, navigation conflict between marine vessels plying the Kuantan Port and those plying the proposed KMH is not anticipated.



6.6.2.3 Shipping Statistics

Total ships and type of ships calling Kuantan Port between 2010 and 2016 are presented as **Figure 6.6.9** and **Table 6.6.4** respectively. Generally, slightly lower ship callings were recorded during the first quarter of the year between 2010 and 2016. On the average, Kuantan Port was receiving about 600 ship callings per quarter but after 2014, a decline of ship callings were observed and the published information indicated that in 2016, the average per quarter were about 450 ship callings.

Liquid tankers contributed to the largest type of ship calling Kuantan Port. This is associated to the nature of industrial activities at the nearby Gebeng Industrial Estate as well as the facilities being offered by the port such as tank storage yard and there are 8 berths for liquid cargo. Some reduction of liquid tankers that were foreign going were observed in the recent years but at the same time, some increase of liquid tankers that were reported to be plying coastal area (assuming to be transhipment activities within the country) were observed.

The next major contributor of ship callings were the general cargo ships, dry bulk ships and feeder ships.



Figure 6.6.9: Total Number of Ships Calling Kuantan Port in Quarter Between 2010 and 2016 (Source: Marine Department Malaysia)

ENVIRONMENTAL IMPACT ASSESSMENT FOR PROPOSED DEVELOPMENT OF KUANTAN MARITIME HUB AT MUKIM SUNGAI KARANG, KUANTAN, PAHANG DARUL MAKMUR

Period			Fore	ian Goina					((Coastal				Grand
	Container	Feeder	General	Liquid	Dry	Other	Total	Container	Feeder	General	Liquid	Dry	Other	Total	Total
	Main Line		Cargo	Tanker	Bulk			Main Line		Cargo	Tanker	Bulk			
2010															
2010	24	101	104	170	70	7	487	_	_	10	38	1	22	80	567
2nd O	24	105	104	187	87	13	535			35	36	_	10	81	616
3rd O	22	88	104	203	110	8	535	_	_	30	45	1	10	86	621
4th Q	18	97	95	213	95	24	542	-	-	7	39	1	12	59	601
2011		•.								-		•			
1st Q	12	103	102	178	100	11	506	-	-	3	42	2	10	57	563
2nd Q	7	106	97	200	131	7	548	-	-	17	40	2	7	66	614
3rd Q	9	109	69	206	142	13	548	-	-	41	57	2	19	119	667
4th Q	6	108	87	188	104	14	507	-		5	60	1	22	88	595
2012															
1st Q	6	102	94	175	105	10	492	-	-	10	53	3	13	79	571
2nd Q	7	109	78	194	123	19	530	-	-	37	69	1	13	120	650
3rd Q	4	103	81	216	119	9	532	-	-	24	81	2	7	114	646
4th Q	4	99	68	219	105	10	505	-	-	13	72	-	13	98	603
2013	0	05	01	101	110	0	470			0	77	~		00	500
ISLQ 2nd Q	3	85	91	181	104	ა ი	4/3	-	-	9	//	2	8	90	203
2110 Q	3	03	101	1/9	104	0	470	-	-	29	04	2	9	124	506
Jth O	8	67	09 135	192	102	4 8	400 534	-	-	5	69	- 1	0 30	105	630
2014	0	07	100	134	122	0	554	_	-	5	00	1	00	105	005
1st Q	10	75	139	181	104	6	515	-	-	3	59	3	5	70	585
2nd Q	9	77	115	182	102	10	495	-	-	14	63	3	26	106	601
3rd Q	5	74	115	192	105	3	494	-	-	20	69	2	14	105	599
4th Q	12	67	113	177	94	13	476	-	-	5	64	1	11	81	557
2015															
1st Q	13	78	103	148	129	7	478	-	-	5	55	1	9	70	548
2nd Q	11	77	87	152	149	12	488	-	-	6	81	-	14	101	589
3rd Q	9	70	74	164	177	10	504	-	-	15	77	3	12	107	611
4th Q	6	70	81	156	199	6	518	-	-	3	69	1	8	81	599
2016															
1st Q	8	77	117	138	92	4	436	-	-	4	67	2	5	78	514
2nd Q	10	69	52	12/	56	5	319	-	-	6	/3	2	8	89	408
	10	80	47	164	54	8	304	-	-	4	66	-	9	90	454

Table C.C.A. Table - (Obline Oalling	. Konstan Barta in Annatan Baharan	0010	
Table 6.6.4 : Type of Ships Calling	g Kuantan Ports in Quarters Betweel	n 2010 and 2016 (Source: Marine	e Department Malaysia)

6.6.2.4 Fishing Vessel

In 2015, it was reported that there are 842 licensed fishing vessels in the district of Kuantan and the nearby fisheries district to the proposed Project site is Sg. Balok. Estuary of Sg. Balok is about 3.3 southwest of the proposed Project site. Sg. Balok serves as fishery landing point and 90 of these licensed fishing vessel was reported to be based at this location. All the licensed fishing vessel are of outboard powered type.

Table 6.6.5: Number of Licensed Fishing Vessel in 2015

Licensed Fishing vessel
90
842

Source: Department of Fishery Malaysia, 2015

The peak fishing season is between April and September during the off-monsoon period, and during the monsoon period, the fishermen usually ply the protected areas near shore or in the river for their catch.

The physical presence of the proposed Project site to be reclaimed is deemed not to hinder the movement of fishing vessel from Sg. Balok as the proposed site is adjoining the southern side of Tanjung Gelang and away from the route of vessel plying the open sea.

6.6.2.5 Forecast of Project Generated Traffic

During Development Stage

The proposed Project's activities during development stage include marine works such as reclamation and dredging activities. The anticipated number of working vessels during this stage is presented in **Table 6.6.6**.

 Table 6.6.6: Type and Number of Marine Vessels During Development Stage

Type of Vessels During Development Stage	Planned Quantity
Reclamation Stage	
Sand carrier	3
Sand Transfer Pump Barge	1
Work Boat	2
Dredging Stage	
Trailing Suction Hopper Dredger	2
Tug Boat	5
Grab Dredger	3
Hopper Barge	8
Work Boat	2

Although the number of vessels planned for the Project activities are not as large as compared to the number of vessels calling Kuantan Port and the number of fishermen fishing vessels, it is expected that during the active period of each activities, the marine traffic movement of the working vessels near the Project site and between the sand source and dredged material disposal site will be significant.

As such, prior notification to the Marine Department and fishermen groups is necessary to warn the mariner of the Project's marine movements. Navigation aids may be deployed at the Project area as advised by the Marine Department.

Any concern associated with marine traffic during Project development stage would be temporary as the land construction activities will use land access once the reclaimed platform is achieved.

During Operational Stage

Meanwhile during the operation stage, the movement of marine vessels plying the proposed KMH will very much depends on the type of activities and work orders received by the shipyard and fabrication yard. An attempt to estimate of number of major marine vessel during operation stage is presented in **Table 6.6.7**. It is anticipated that these additional marine vessels will not have significant impact to the daily marine traffic volume in the area and the existing navigation control system by the Kuantan Port. Any normal navigation rules required by the Marine Department will be adhered to ensure safe marine operation in the area.

Table 6.6.7: Estimate of Major Marine Vessels Plying the Proposed KMH During Operation Stage

Operation Stage	Estimate Number of Vessel Per Year (At Peak in 2026)
Ship Repair (estimate ship repair and maintenance works)	100
Ship (estimate ship building works)	12
Fabrication Yard (estimate 2 shipments of material / products per month)	24

6.6.3 Airport

Sultan Haji Ahmad Shah Airport is the closest airport and is located about 30 km from the proposed Project site. This airport supports the domestic and some international aviation needs of Pahang State.

6.6.4 Railway

A new railway link has recently being announced and it is known as the East Coast Rail Link (ECRL). This will provide additional access option to the site from the northern states (Kelantan, Terengganu and Pahang) and west coast and central region, since there is a planned stop station near Kuantan Port. This proposed railway system is estimated to be operational by July 2024.



Figure 6.6.10: The Proposed ECRL Corridor and Associated Linkages

6.6.5 Electricity

The electricity supply in the Kuantan is provided by Tenaga Nasional Berhad (TNB) and PETRONAS Gas Berhad's centralized utility facilities (CUF) at the Gebeng area.

6.6.6 Water Supply

The water supply network for Gebeng is managed by the Pahang Water Supply Department and comprises a 32 MGD supply from the Semambu Water Treatment Plant, with three balancing reservoir at 4.5 MGD. There are also two other sources, namely the 2 MGD and 1.5 MGD reservoirs at Bukit Penggorak and Gebeng, and 0.5 MGD and 1.0 MGD reservoirs at Bukit Merah Gebeng.

6.6.7 Telecommunication

Major telecommunication provider in the Kuantan District is Telekom Berhad while other mobile providers are also available.

6.6.8 Solid Waste Disposal

Solid waste generated from Kuantan District is managed by Alam Flora and the nearest landfill is Jabor Jerangau Landfill, Kuantan.

