EXECUTIVE SUMMARY

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PROPOSED INTEGRATED SUSTAINABLE PALM OIL COMPLEX (iSPOC) AT PART OF PTD 402, MUKIM KAMBAU, DAERAH KOTA TINGGI, JOHOR DARUL TAKZIM

INTRODUCTION

PROJECT PROPONENT
Johor Plantations Group Berhad
Level 11, Menara KOMTAR
Johor Bahru City Centre
80000 Johor Bahru
Johor Darul Takzim

EIA CONSULTANT
Alam Dinamik Sdn Bhd
No. 19 & 19A, Jalan Bukit Impian 1
Taman Impian Emas
81300 Skudai, Johor Darul Takzim

LEGAL REQUIREMENT
First Schedule
6. Industry
(a) Chemical
Production capacity of each product or combined products of 100 tonnes or more per day.

17. Industrial Estate Development
Development of industrial estate covering an area of 20 hectares or more.

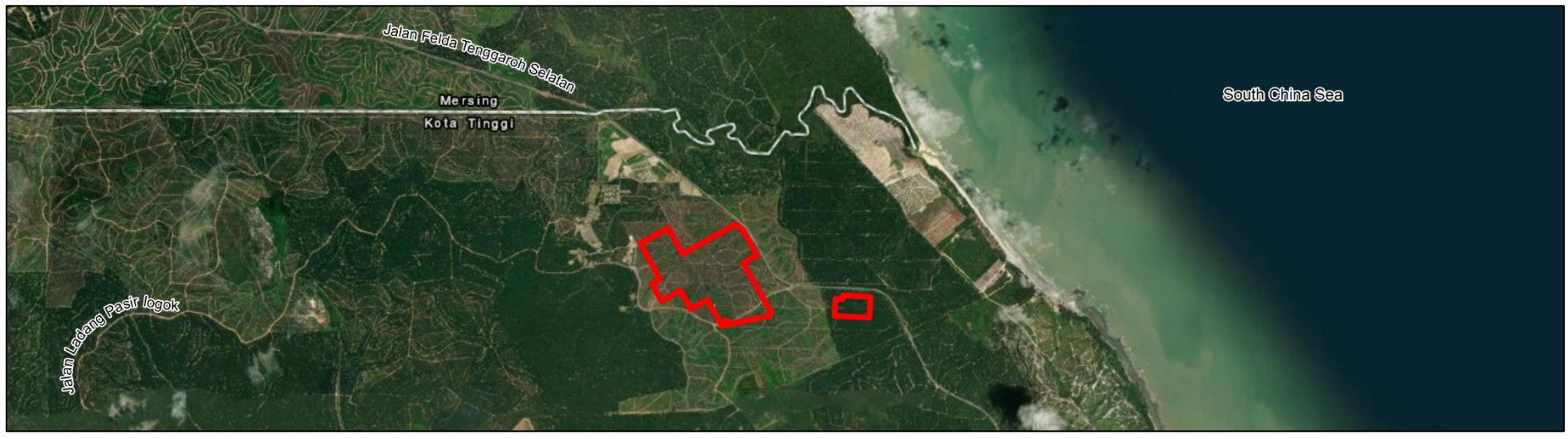
STATEMENT OF NEEDS

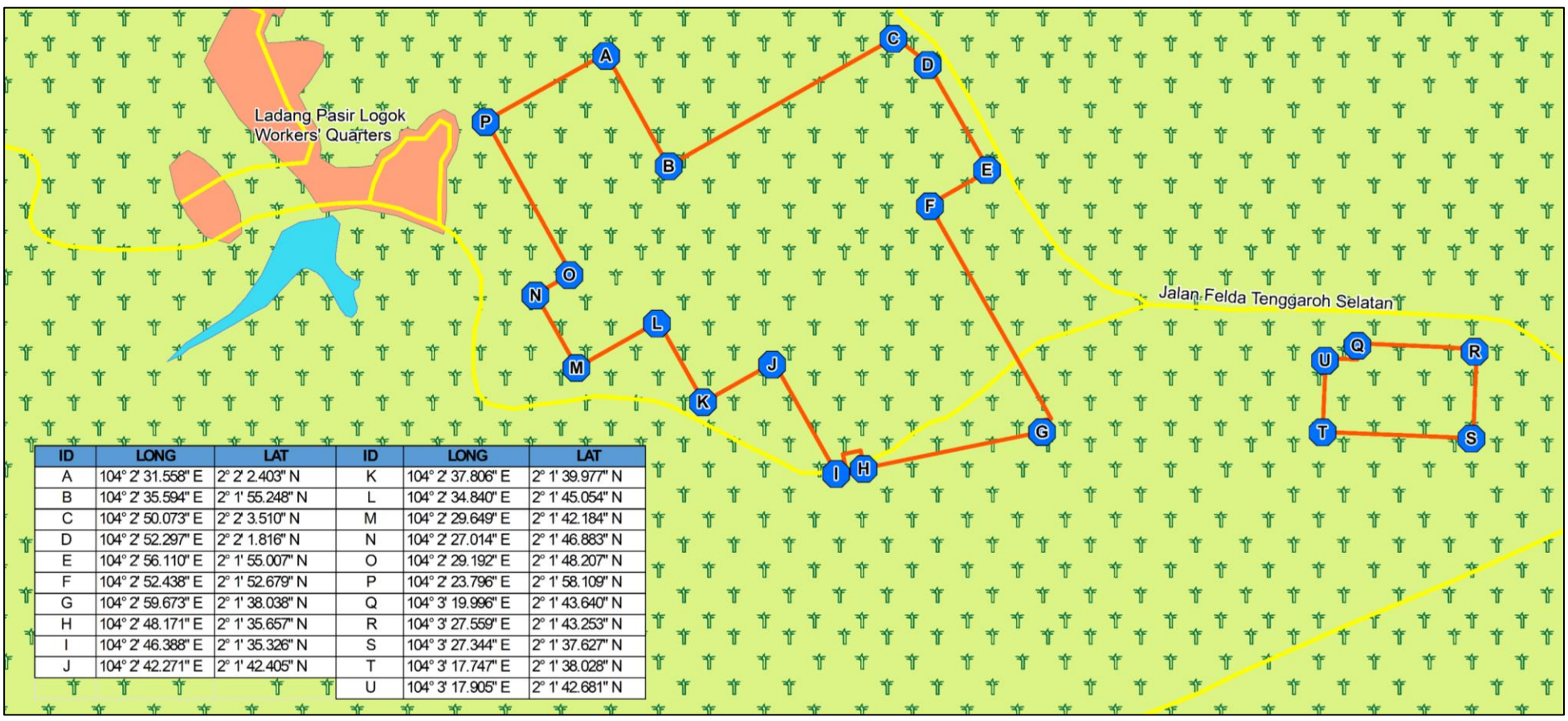
The proposed Project will bring about the following benefits:-

a) The integrated complex streamlines operations by consolidating all manufacturing stages in a single location.
b) The complex's proximity to existing JPG plantations keeps logistical issues and environmental impacts, to a minimum.
c) By utilising palm oil mill by products, specifically biomass and biogas, to produce green energy - this will create new value within the circular economy, efficiently utilising resources.
d) The development of iSPOC will rely entirely on renewable energy (RE) to produce sustainable palm oil products, which can minimise environmental impacts such as deforestation and biodiversity loss, leading to a potential reduction of greenhouse gas emissions.

PROJECT LOCATION

The proposed Project site is located within oil palm plantation, Ladang Pasir Logok at Mukim Kambau, Daerah Kota Tinggi, Johor Darul Takzim.





ID	LONG	LAT	ID	LONG	LAT
A	104° 2' 31.558" E	2° 2' 2.403" N	K	104° 2' 37.806" E	2° 1' 39.977" N
B	104° 2' 35.594" E	2° 1' 55.248" N	L	104° 2' 34.840" E	2° 1' 45.054" N
C	104° 2' 50.073" E	2° 2' 3.510" N	M	104° 2' 29.649" E	2° 1' 42.184" N
D	104° 2' 52.297" E	2° 2' 1.816" N	N	104° 2' 27.014" E	2° 1' 46.883" N
E	104° 2' 56.110" E	2° 1' 55.007" N	O	104° 2' 29.192" E	2° 1' 48.207" N
F	104° 2' 52.438" E	2° 1' 52.679" N	P	104° 2' 23.796" E	2° 1' 58.109" N
G	104° 2' 59.673" E	2° 1' 38.038" N	Q	104° 3' 19.996" E	2° 1' 43.640" N
H	104° 2' 48.171" E	2° 1' 35.657" N	R	104° 3' 27.559" E	2° 1' 43.253" N
I	104° 2' 46.388" E	2° 1' 35.326" N	S	104° 3' 27.344" E	2° 1' 37.627" N
J	104° 2' 42.271" E	2° 1' 42.405" N	T	104° 3' 17.747" E	2° 1' 38.028" N
			U	104° 3' 17.905" E	2° 1' 42.681" N

EXECUTIVE SUMMARY

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OVERALL PROJECT LAYOUT

LEGEND:

- PALM OIL MILL
- REFINERY PLANT
- RENEWABLE ENERGY POWER PLANT
- ANIMAL FEED MILL
- KERNEL CRUSHING PLANT
- CENTRALISED LABORATORY AND OFFICE BUILDING
- RESIDENTIAL COMPLEX
- LOADING RAMP
- CENTRALIZED WORKSHOP AND STORE
- DETENTION POND B
- GREEN AREA

EXECUTIVE SUMMARY

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PROJECT ACTIVITIES

CONSTRUCTION STAGE
- Survey setting out
- Site clearing
- Biomass management
- Earthwork
- Construction of plants

OPERATIONAL STAGE
Plant operation
- Palm oil mill
- Refinery plant
- RE Power plant
- Animal feed mill
- Kernel crushing plant

Discharge of treated effluent
- Palm oil mill effluent (POME)
- Refinery effluent

ABANDONMENT STAGE
- In the event of project abandonment stage, the Project Proponent will notify DOE Johor. Necessary report will be submitted to relevant authorities to address the management of potential impacts during abandonment stage.

PROJECT IMPLEMENTATION SCHEDULE

The earthwork phase and construction of the proposed Project will take approximately 15 months.

Activity	2024				2025				2026				2027
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
Preparation for development, authorities approval and engineering, procurement, construction and commissioning (EPCC)													
Project detail design & management approval													
Technical specification preparation													
Tendering													
Authorities approval													
Commencement of construction works - Palm oil mill - Refinery - Renewable energy power plant - Kernel crushing plant - Animal feed mill - Residential complex													
Plant commissioning													
Full operation of iSPOC													

EXISTING ENVIRONMENT

Topography and Land Use
Elevation between 2.54 m to 32.28 m above mean sea level. The Project site is surrounded by oil palm plantation. The nearest residential area is located at 0.15 km west of the Project site. Other residential areas are located more than 5.0 km from the Project site.

Geology and Soil
The lithology of the site is permian which mainly phyllite, slate and shale with subordinate sandstone and schist. There is prominent development of limestone throughout the succession. The soil at the Project site is of Pohoi – Durian – Tavy type.

River Water Quality
River water was sampled at 9 stations. Water Quality Index (WQI) of all sampling stations fell under Class III.

Traffic
The proposed Project site can be accessed via Senai-Desaru Expressway (SDE) – Exit 2204 Ulu Tiram towards Jalan Kota Tinggi, Jalan Jemaluang, Jalan Lok Heng, Jalan Tanjung Sedili, Jalan Sedili and Jalan Felda Tenggaroh Selatan then to the Project site. Jalan Felda Tenggaroh Selatan is currently operating at level of service (LOS) A.

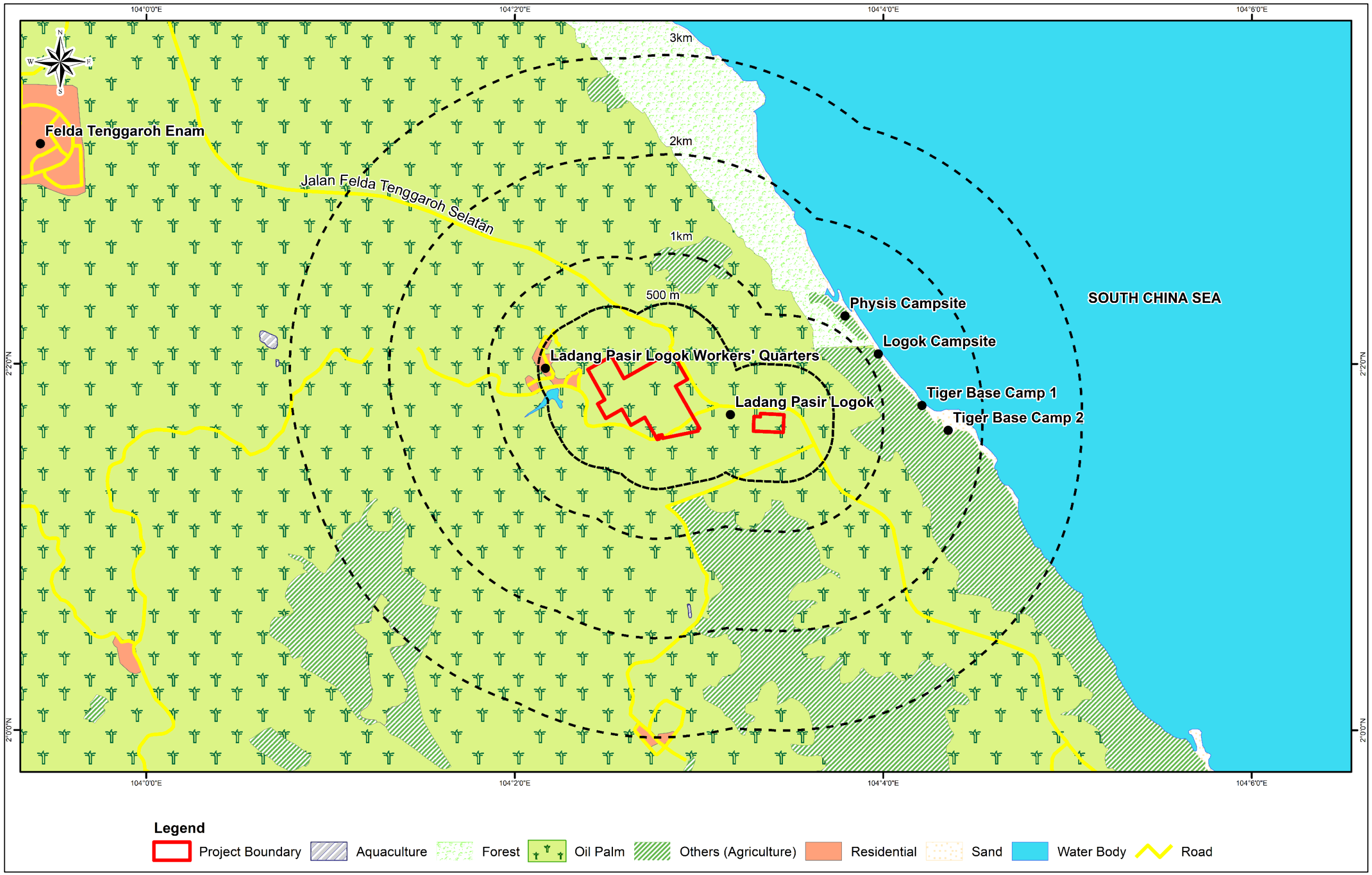
Ambient Air
Sampling of ambient air quality was carried out at 3 stations. The ambient air quality at all sampling stations are well below the specified limits.

Noise Level
Measurement of noise was carried out at 3 stations. The noise level at all sampling stations are well below the specified limits.

Hydrology
The Project site is ocated within Sg. Paloi and Sg Perepat catchments. Sg Perepat catchment is located within Sg Sedili Besar river basin. Surface runoff from industrial complex drains into Sg. Paloi. Surface runoff from residential complex drains into Sg Perepat. Sg Perepat meanders about 14.0 km before confluence with Sg Sedili Besar.

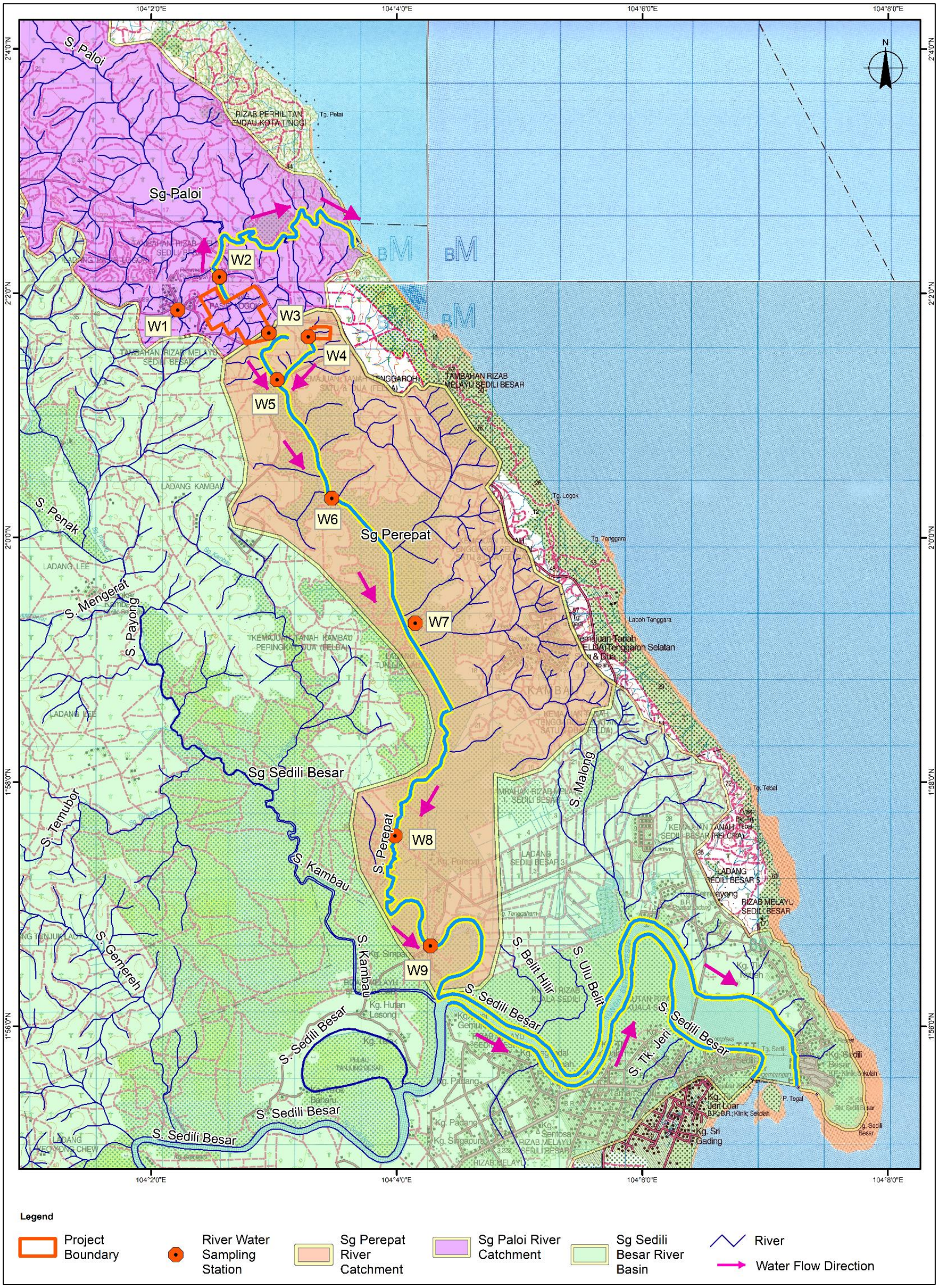
Climate & Meteorology
Based on Mersing Meteorological Station data, the dominant wind direction is from southwest to northeast. The monthly mean rainfall amount based on data from Felda Bukit Waha station for year 2014 – 2023 was in the range of 110.2 – 468.3 mm .

LAND USE 3 KM RADIUS

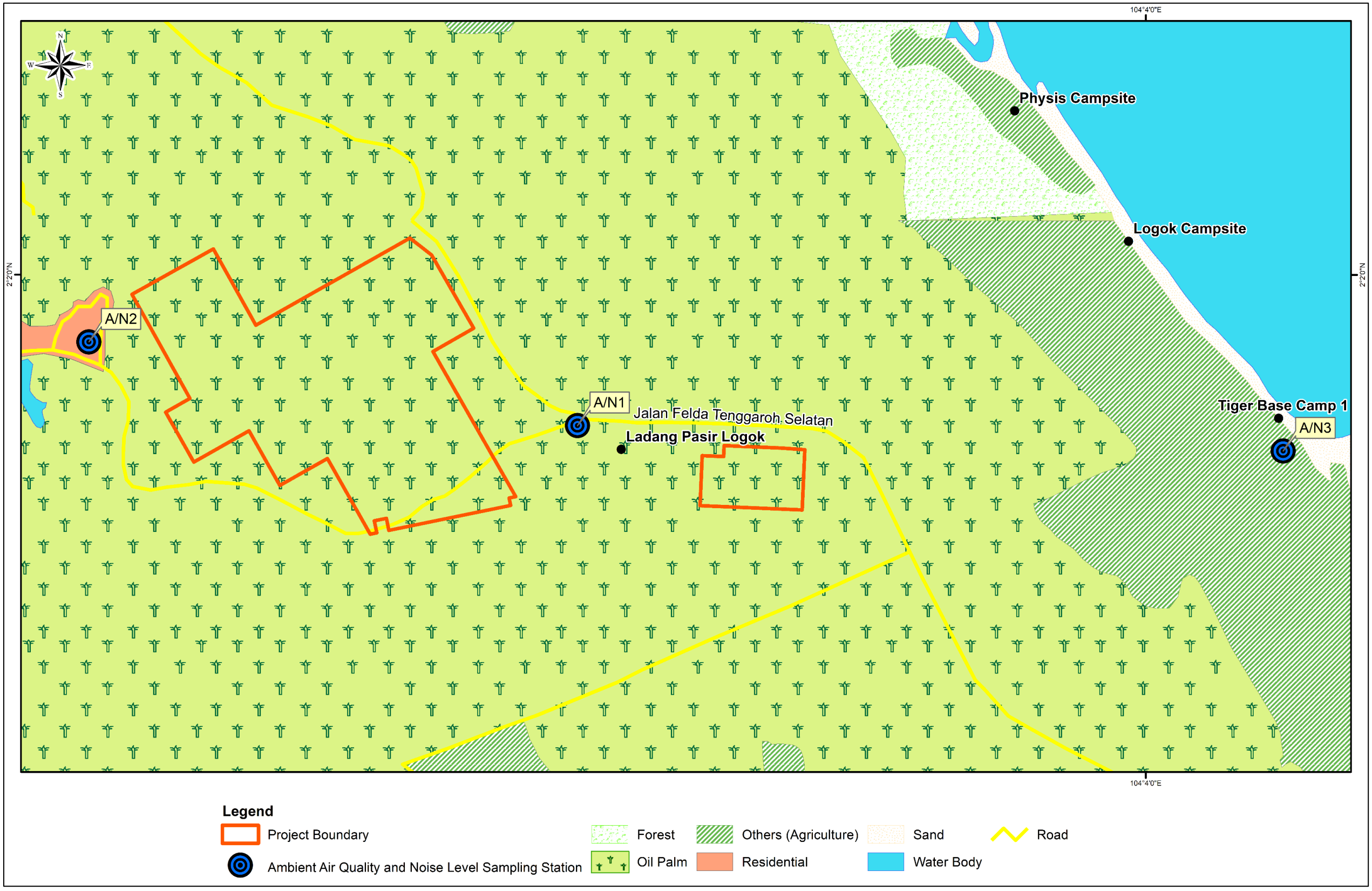


PROPOSED INTEGRATED SUSTAINABLE PALM OIL COMPLEX (iSPOC) AT PART OF PTD 402, MUKIM KAMBAU, DAERAH KOTA TINGGI, JOHOR DARUL TAKZIM

SAMPLING STATIONS FOR RIVER WATER QUALITY



SAMPLING STATIONS FOR AMBIENT AIR QUALITY AND NOISE



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RESULTS OF RIVER WATER QUALITY

Classification of Water Quality Based on National Water Quality Standards for Malaysia (Sampled on 31st August 2024 and 18th October 2024)

Parameter	Station W1	Class	Station W2	Class	Station W3	Class	Station W4	Class	Station W5	Class
Dissolved Oxygen (mg/l)	5.52	II (5-7)	3.25	III (3-5)	2.69	IV (1-3)	3.12	III (3-5)	2.87	IV (1-3)
BOD_5 at 20°C (mg/l)	8	IV (6-12)	6	IV (6-12)	6	IV (6-12)	8	IV (6-12)	6	IV (6-12)
COD (mg/l)	24	II (10-25)	29	III (25-50)	17	II (10-25)	23	II (10-25)	18	II (10-25)
Total Suspended Solids (mg/l)	19	I (<25)	3	I (<25)	2	I (<25)	9	I (<25)	17	I (<25)
Ammoniacal Nitrogen (mg/l)	0.26	II (0.1-0.3)	0.37	III (0.3-0.9)	0.10	II (0.1-0.3)	0.35	III (0.3-0.9)	0.10	II (0.1-0.3)

Parameter	Station W6	Class	Station W7	Class	Station W8	Class	Station W9	Class
Dissolved Oxygen (mg/l)	6.28	II (5-7)	5.66	II (5-7)	5.44	II (5-7)	6.94	II (5-7)
BOD_5 at 20°C (mg/l)	13	V (>12)	8	IV (6-12)	4	III (3-6)	10	IV (6-12)
COD (mg/l)	43	III (25-50)	30	III (25-50)	12	II (10-25)	30	III (25-50)
Total Suspended Solids (mg/l)	26	II (25-50)	12	I (<25)	4	I (<25)	32	II (25-50)
Ammoniacal Nitrogen (mg/l)	0.30	III (0.3-0.9)	0.18	II (0.1-0.3)	0.20	II (0.1-0.3)	0.15	II (0.1-0.3)

Water Quality Index (WQI) of Sampling Stations

Parameters	Sampling Station								
	W1	W2	W3	W4	W5	W6	W7	W8	W9
Water Quality Index (WQI)	75	62	60	62	63	63	72	74	74
Class	III	III	III	III	III	III	III	III	III

RESULTS OF AMBIENT AIR QUALITY

Sampled on 17th until 19th October 2024

Parameter	Unit	Concentration at sampling station			*Limit
		A1	A2	A3	
Particulate Matter less than 10 micron (PM_{10})	$\mu g/m^3$	69.4	55.6	41.7	100 $\mu g/m^3$ (24 hours)
Particulate Matter less than 2.5 micron ($PM_{2.5}$)	$\mu g/m^3$	13.9	13.9	13.9	35 $\mu g/m^3$ (24 hours)
Carbon Monoxide (CO)	mg/m^3	<0.0001	<0.0001	<0.0001	30 mg/m^3 (1 hour) 10 mg/m^3 (8 hours)
Nitrogen Dioxide (NO_2)	$\mu g/m^3$	<1	<1	<1	70 $\mu g/m^3$ (24 hours)
Sulphur Dioxide (SO_2)	$\mu g/m^3$	<1	<1	<1	80 $\mu g/m^3$ (24 hours)

**Malaysia Ambient Air Quality Standards (MAAQS) 2020*

RESULTS OF NOISE LEVEL

Measured on 17th until 19th October 2024

Sampling Station	Noise Level L_{Aeq}	DOE Recommended Noise Level*
Day Time		
N1	47.8	65 dBA
N2	43.7	
N3	43.1	
Night Time		
N1	42.0	60 dBA
N2	41.6	
N3	39.7	

**Guidelines for Environmental Noise Limits and Control (DOE Malaysia, 2019) – Second Schedule, Recommended Permissible Sound Level (LAeq) by Receiving Land Use Existing Built Up Areas; Suburban and Urban Residential, Mixed Development*

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POTENTIAL IMPACTS AND MITIGATIONS

Soil Erosion

IMPACT
- Soil erosion and sedimentation during construction phase.

MITIGATION
- Proper planning of earthwork and implementation of BMPs such as perimeter earth drain, check dam, sediment basin and wash trough.

Hydrology

IMPACT
- Change of land use will increase the amount of surface runoff during construction and operational phase.

MITIGATION
- Sediment basin and drain at the Project site shall be properly maintained during construction phase.
- Provision of detention pond to regulate the post development flow.

Water Resources

IMPACT
- Water for plant operation will be sourced from the existing reservoir at Ladang Pasir Logok and Sg Paloi.
- The impact towards downstream is expected to be minimum because water in Sg Paloi is more than sufficient, ensuring that downstream flow remains unaffected.

MITIGATION
- To ensure sufficient water supply during operational phase, the existing reservoir at Ladang Pasir Logok is proposed to be upgraded.
- This is to increase the storage capacity to cater for process water demand.

River Water

IMPACT
- High TSS in the receiving stream during construction phase.
- During operational phase, there will be discharge of treated effluent from palm oil mill and refinery which contain pollutants such as BOD, COD, AN, TSS and O&G.

MITIGATION
- Implementation of good BMPs and well-maintained silt fence and sediment basin.
- Effluent discharge from palm oil mill shall comply with limits specified in Second Schedule, Parameter Limits for Watercourse Discharge, Environmental Quality (Prescribed Premises) (Crude Palm Oil) Regulations 1977.
- Effluent discharge from refinery shall comply with limits specified in Environmental Quality (Industrial Effluent) Regulations 2009.

Ambient Air

IMPACT
- Earthwork and construction activities will result in suspended particulates or airborne dust.
- The movement of vehicles on access roads and exhaust fumes could stir up dust during construction phase.
- During operational phase, there will be emission from operation of biomass boiler and biogas plant.

MITIGATION
- Spraying of water on the roads especially at exit and inlet points.
- Vehicles to pass through a wash trough prior to leaving the construction site
- Monitoring of traffic volume and observation of speed limits for heavy vehicles during construction phase.
- Electrostatic precipitator (ESP) will be installed at biomass power plant to control particulate matter emission.
- Biogas plant will be equipped with bio-scrubber and flare system.

Noise Level

IMPACT
- During construction phase, the operation of stationary and mobile equipment or machineries may contribute to the noise level.
- During operational phase, noise due to the operation of the proposed Project is mainly contributed by palm oil mill operation and refinery plant which is considered to be insignificant.

MITIGATION
- Full hoarding of ample height and shielding to control noise propagation for areas without planned noise barriers.
- Workers shall be provided with filter masks and ear protection devices (ear plugs, ear muffs and helmets etc.)
- Best practice procedures (such as turning off equipment or machines when not in use).
- Regular equipment maintenance.

Traffic

IMPACT
- Construction traffic will be mostly lorries delivery materials to the site as well as removing rubbish and debris.
- The development of the proposed Project will lead to increase in traffic volume on the surrounding roads.

MITIGATION
- Effective construction traffic management.
- Heavy vehicles should not be driven at speed exceeding the authorized speed limits or impose temporary speed limit of 40 km/h.
- There will be three (3) new access points for the proposed Project.
- The junctions should be upgraded as suggested in traffic impact assessment (TIA) report.

Waste Management

IMPACT
- Activities during construction and operational phase will generate scheduled waste and solid waste.

MITIGATION
- Scheduled waste should be managed in accordance with the Environmental Quality (Scheduled Wastes) Regulations 2005.
- Solid waste shall be disposed of at the disposal site approved by the local authority.

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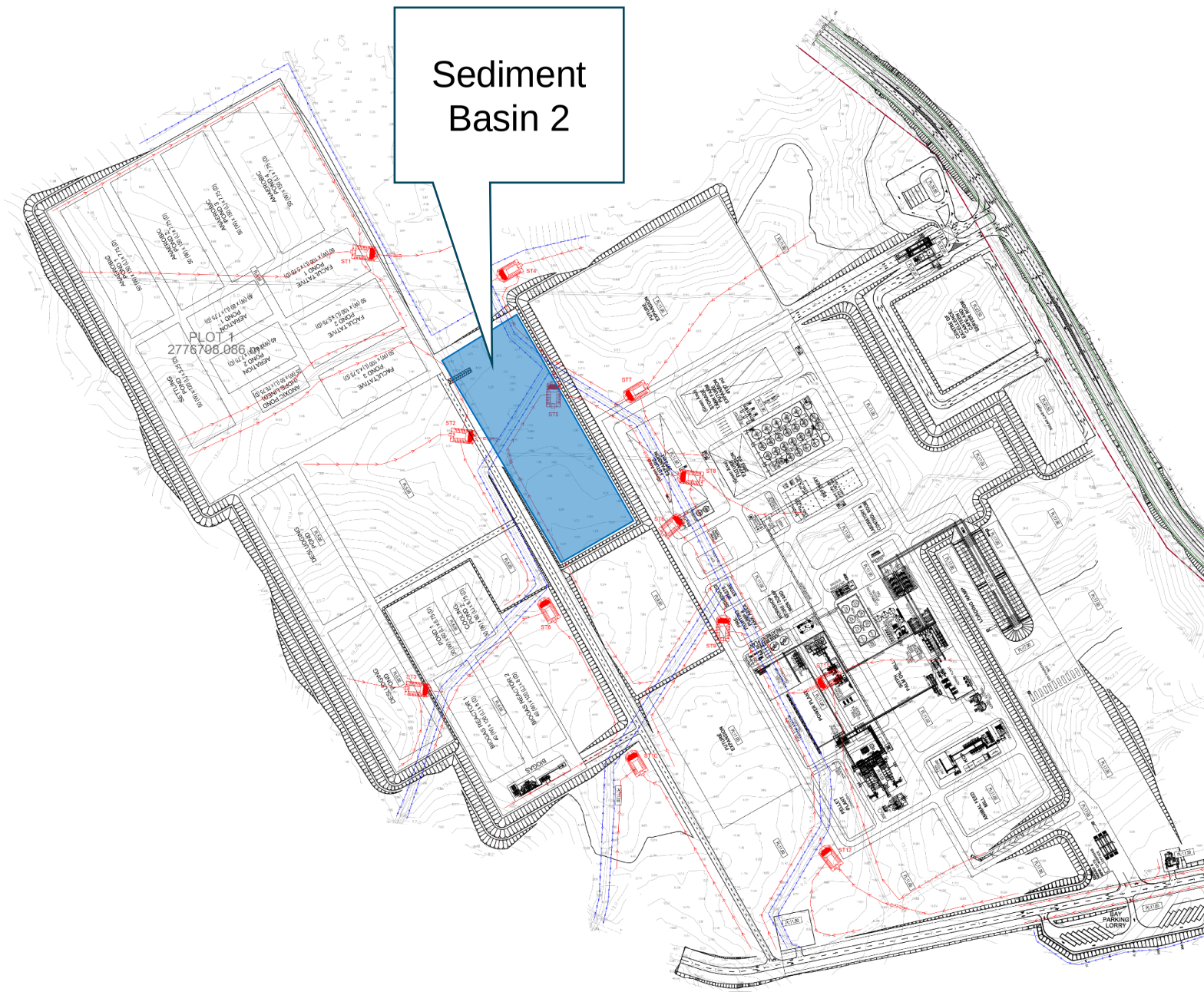
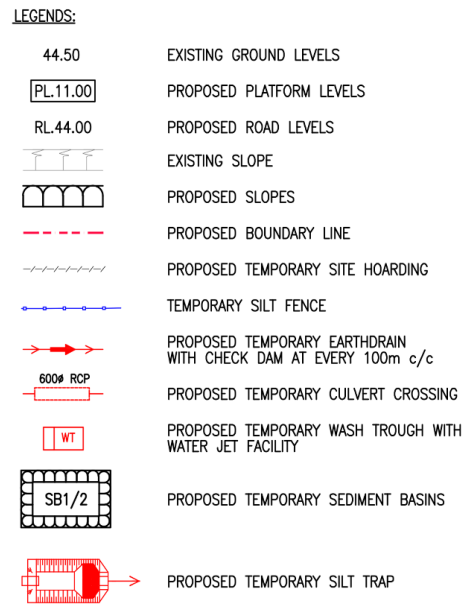
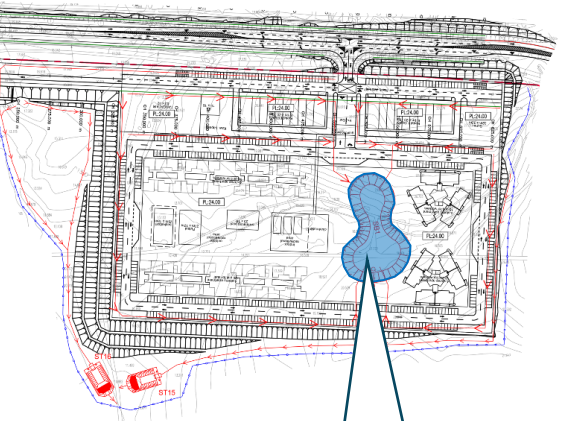
LAYOUT OF LAND-DISTURBING POLLUTION PREVENTION AND MITIGATING MEASURES (LD-P2M2)







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PROPOSED ENVIRONMENTAL MONITORING PROGRAMME

During Construction Phase

IMPACT MONITORING

River Water Quality

Monitoring of DO, BOD, COD, TSS, oil and grease, AN and Turbidity at stations W2 and W4.

Ambient Air and Noise Level

Monitoring of ambient air quality and noise level at station A1/N1, A2/N2 and A3/N3.

PERFORMANCE MONITORING

Sediment basin
- Monitor silt storage zone and basin outlet.
- Daily checking and desilting for every 3 months or as needed.

Temporary earth drain
- Monitor drain.
- Daily checking and desilting for every 3 months or as needed.

Wash trough
- Monitor catch basin.
- Daily checking and desilting for every 3 months or as needed.

Temporary Access road
- Road should be well-paved to prevent dust generation and prevent damage to vehicles using the road.

Workshop
- Daily checking to ensure no oil spillage and proper disposal of waste oil and paint.

Silt fence
- Monitor silt collection area.
- Daily checking.

COMPLIANCE MONITORING

Sediment Basin
- Monitor discharge point of sediment basin during storm event more than 12 mm.
- Discharge Total Suspended Solid (TSS) <50 mg/l.

Scheduled Waste
- Collection and disposal
- Compliance with Environmental Quality (Scheduled Wastes) Regulations 2005 for disposal .

Solid Waste
- Disposal of solid waste
- Compliance with Local authority guidelines for disposal

During Operational Phase

IMPACT MONITORING

River Water Quality

Monitoring of DO, BOD, COD, TSS, oil and grease, AN stations W3, W5 and W6.

Ambient Air and Noise Level

Monitoring of ambient air quality and noise level at station A1/N1, A2/N2 and A3/N3.

PERFORMANCE MONITORING

Effluent treatment plant (ETP) of POME and refinery effluent
- Daily checking of flowrate, pH, ORP, DO, MLSS, MLVS, SVI, SOUR at treatment tanks / ponds.

Bio-scrubber
- Monitor outlet H_2S content at scrubbing media.
- Daily checking.

Activated carbon filter
- Daily checking of bed operating and inlet gas temperature, gas flowrate and inlet gas moisture content at carbon filter.

Flare system
- Monitor gas flowrate at the burner.
- Daily checking.

COMPLIANCE MONITORING

Refinery Effluent Treatment Plant
- Compliance with Environmental Quality (Industrial Effluent) Regulations 2009 at discharge point.

POME Treatment Plant
- Compliance with Environmental Quality (Prescribed Premises) (Crude Palm Oil) Regulations 1977 at discharge point.

Air Pollution Control System
- Compliance with Environmental Quality (Clean Air) Regulations 2014 at discharge point.

Scheduled Waste
- Collection and disposal.
- Compliance with Environmental Quality (Scheduled Wastes) Regulations 2005 for disposal.

Solid Waste
- Disposal of solid waste.
- Compliance with local authority guidelines for disposal.

During Abandonment / Decommissioning Phase

IMPACT MONITORING

River Water Quality

Monitoring of DO, BOD, COD, TSS, oil and grease, AN and Turbidity at stations W2 and W4.

Ambient Air and Noise Level

Monitoring of ambient air quality and noise level at station A1/N1, A2/N2 and A3/N3.