



UNIVERSITI
TEKNOLOGI
PETRONAS

FINAL EXAMINATION MAY 2024 SEMESTER

**COURSE : CCM5263 – ENVIRONMENTAL RISK & IMPACT
ASSESSMENT**

DATE : 10 AUGUST 2024 (SATURDAY)

TIME : 2:30 PM – 5:30 PM (3 HOURS)

INSTRUCTIONS TO CANDIDATES

1. Answer **ALL** questions in the Answer Booklet.
2. Begin **EACH** answer on a new page in the Answer Booklet.
3. Indicate clearly answers that are cancelled, if any.
4. Where applicable, show clearly steps taken in arriving at the solutions and indicate **ALL** assumptions, if any.
5. **DO NOT** open this Question Booklet until instructed.

Note :

- i. There are **NINE (9)** printed pages in this **double-sided** Question Booklet including the cover page and appendices.

1. On April 20th, 2010, the Deepwater Horizon oil platform exploded in the Gulf of Mexico. The resulting spill was deemed to be among history's worst environmental disasters. In addition to the damage inflicted on the planet, eleven workers died in the explosion. Nearly five million barrels of crude oil entered the Gulf before the leak created by the explosion was stopped, and there had been suggestions that the local environment was irreparably harmed by the spill. While some of the spill was managed to be removed or contained, large part of it had made it through to some areas where cleaning was inaccessible. Due to the severity of the incident, complete cleaning process and environmental restoration are impossible. Discuss the incident based on:

- Class of incident
- Causes of incident
- Impact of the incident towards environment and socio-economic aspects

[13 marks]

As a consultant hired by British Petroleum (BP) company, propose a suitable hazard management plan to prevent the incident from happening again.

[12 marks]

2. Adsorption process using activated carbon material derived from agriculture waste products has now gained its popularity as a method of cleaning up spillage for hazardous pollutants as it offers various advantages compared to the conventional cleaning methods. In addition, sustainable utilization of agriculture waste is aligned with the principles of circular economy, which aims to minimize waste generation and conserve natural resources. Propose **TWO (2)** examples on the utilization of activated carbon materials in hazardous pollutants cleaning. Provide detailed descriptions, diagrams, type of spills handled, and advantages and disadvantages of each example of utilization.

[25 marks]

3. You are the Process Safety Manager at a chemical manufacturing plant that produces a range of hazardous chemicals, including chlorine and ammonia. The plant is located near a residential area and a river that supplies water to the local community. Your facility has a comprehensive emergency response plan (ERP) in place, which includes procedures for handling chemical spills, fires, explosions, and toxic gas releases. Recently, during a routine inspection, it was discovered that one of the storage tanks containing ammonia had a small leak. The leak has not yet led to any immediate danger, but it has the potential to escalate if not addressed promptly. Additionally, there are concerns about the impact of the ammonia on the nearby river and residential area.

You have been tasked with implementing the ERP to address the ammonia leak. Propose your ERP by considering the following points:

- The initial steps would be taken upon discovering the ammonia leak. Include the personnel involved and the immediate actions required.
- The key stakeholders and communication methods would be used to ensure timely and accurate information dissemination.
- The strategies and equipment would be used to contain and mitigate the ammonia leak. Consider both short-term and long-term measures to prevent the leak from escalating and to minimize environmental impact.
- The steps would be taken after the immediate threat has been managed to analyse the incident and improve future ERP.
- Any other relevant considerations to develop comprehensive ERP for this event.

[20 marks]

4. The state of Johor in Malaysia is actively seeking opportunities to stimulate local economic growth and improve the overall development of the region. As part of these efforts, a proposal has been put forth to establish rubber tree plantations on 3775 hectares of land in the Endau region of Johor. The proposed project phases are shown in **FIGURE Q4**.

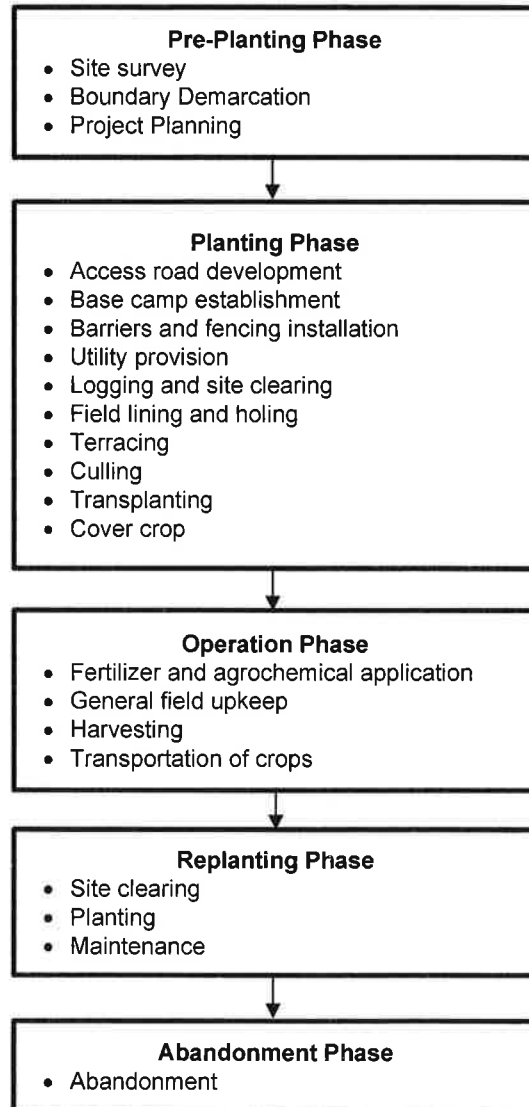


FIGURE Q4: Overall project phases

However, the conversion of natural land for rubber tree plantations raises questions about deforestation, habitat loss, soil erosion, water resource management, chemical usage, and the overall sustainability of the project. Given these concerns, it is imperative to conduct a comprehensive environmental risk and impact assessment to evaluate the potential consequences of establishing rubber tree plantations in the Endau region.

Based on the overall project flow, geographical information, and existing environment surrounding the project area, evaluate the potential environmental risks and impacts associated of all project phases which include the air quality, noise, water quality and waste management (if applicable). Propose mitigation plans to minimize the impact of the project. The existing environment of the project area is shown in **APPENDIX I**.

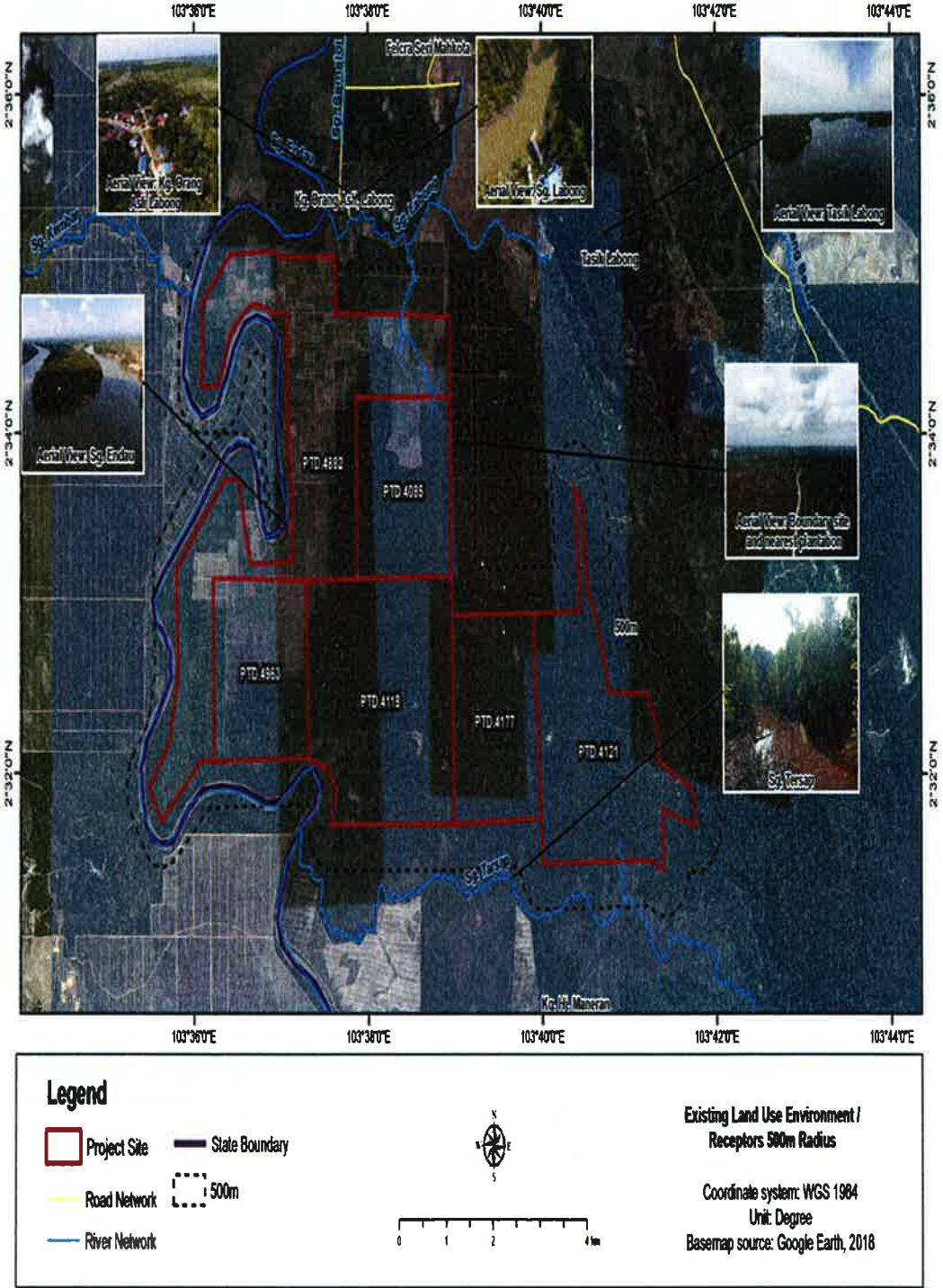
[30 marks]

-END OF PAPER-

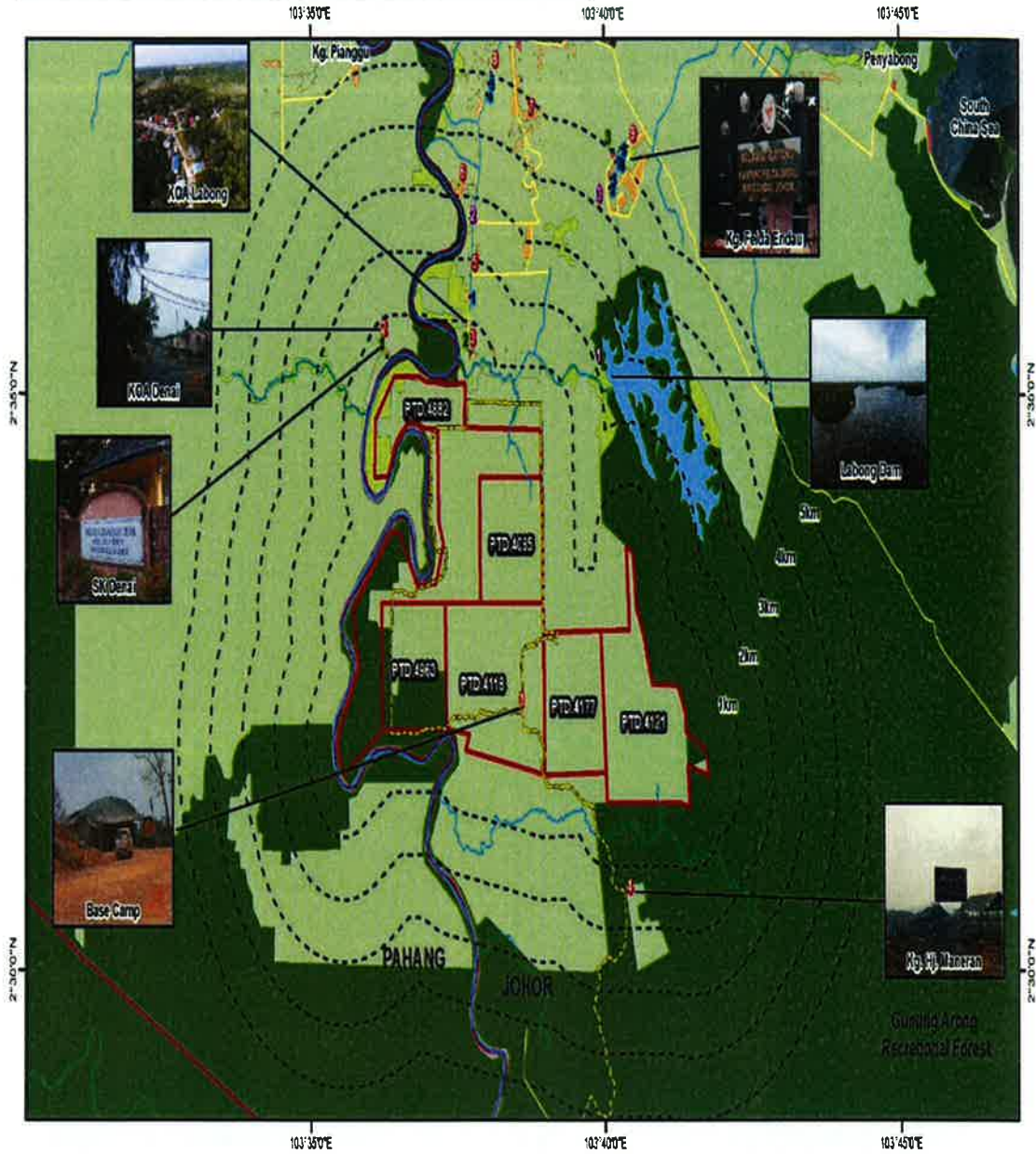
APPENDIX I: PROJECT LOCATION AND EXISTING ENVIRONMENT

PROJECT LOCATION:


PTD 4882, PTD 4085, PTD 4963, PTD 4118, PTD 4177 and PTD 4121 in Mukim Padang Endau, Daerah Mersing, Johor Darul Takzim. Size: 3775.34 ha (9329.05 ac)

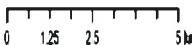


EXISTING ENVIRONMENT LAND USED WITHIN 5KM:



Legend		Land Use		Current Land Use and Sensitive Receptors 5km Radius within Proposed Project Site	
	Project Site		Commercial		Forest
	Road Network		Cropland		Residential
	River Network		Institution & Public Facilities		Water Body
	State Boundary		Proposed Access Road		Shrub / Bush





Coordinate system: WGS 1984
 Unit: Degree
 Basemap source: Google Earth, 2018
 Land Use Reference:
 I-Plan, JPBD (Current Land Use 2018)

EXISTING ENVIRONMENT:

