

**ENVIRONMENTAL IMPACT ASSESSMENT STUDY OF A
PROPOSED HOUSING DEVELOPMENT PROJECT**

TING ING ING



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Disahkan oleh
[Signature]
(TANDATANGAN PENYELIA)

Alamat tetap: Lor 9890, Lrg 3 Hills Park,
Jln 3 Hills Park, 93300 Kuching.

DR. LAW PUONG LING
(Nama Penyelia)

Tel: 082-330533

Tarikh: 18-4-2003

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ENVIRONMENTAL IMPACT ASSESSMENT
STUDY OF A PROPOSED HOUSING DEVELOPMENT PROJECT



BY

TING ING ING

SUMMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR
THE BACHELOR OF ENGINEERING (HONS.) IN CIVIL ENGINEERING.

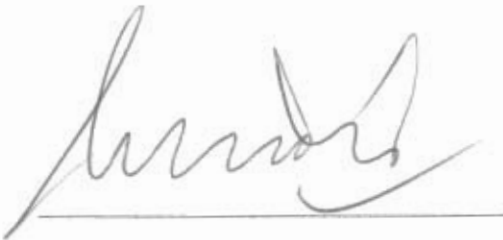
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FACULTY OF ENGINEERING

UNIVERSITI MALAYSIA SARAWAK

APPROVAL SHEET

This Final Year Project Report entitled "ENVIRONMENTAL IMPACT ASSESSMENT STUDY OF A PROPOSED HOUSING DEVELOPMENT PROJECT" prepared and submitted by TING ING ING in partial fulfillment of the requirement for Bachelor of Engineering (Civil) is here by accepted.



DR. LAW PUONG LING

Project Supervisor

Civil Engineering Program

Faculty of Engineering, UNIMAS

Date: 19-4-2003



TING ING ING

Author

Civil Engineering Program

Faculty of Engineering, UNIMAS

Date: 18-4-2003

ABSTRACT

Having examined the available information on the site and the proposed activities associated with the development of the project, this study will focus on sewerage treatment and disposal, collection and disposal of solid waste, traffic condition and water quality. From this environmental impact assessment study has shown that the proposed housing development project is viable and would not cause significant adverse impact on its surrounding environment. The main issue of concern is the changes in the hydrological features. This impact is mitigatable with proper channel size and depth specifications and the proper management procedures. Water quality issues can be addressed through proper installation of septic tanks and proper maintenance and operation of the proposed septic tanks. Proper landscaping of the project area will help to improve the aesthetic value of the project area when completed. The permanent loss of vegetation of the proposed site is just a trade-off to a more structure landscape and a healthy living environment for the people who are going to occupy the area,

ABSTRAK

Dengan semua maklumat yang ada dan aktiviti yang bakal dijalankan oleh pembinaan projek ini, kajian EIA ini akan menumpu perhatian kepada pembuangan dan pemulihan sisa, pengumpulan sisa, keadaan traffic dan qualiti air di persekitaran projek ini. Setelah membuat kajian EIA, projek yang dicadangkan tidak akan membawa kesan sampingan kepada alam sekitar. Isu yang utama ialah perubahan kepada hidrologi. Masalah ini dapat diatasi dengan pembinaan parit yang sempurna. Di samping itu, qualiti air dapat diatasi dengan pemasangan tangki septik yang sesuai dan beroperasi sempurna. Selain itu, landscap yang dirancang dapat meningkat nilai tanah selepas penyempurnaan projek dan memberi alam sekitar yang sihat kepada manusia.

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CHAPTER 1

INTRODUCTION

1.0 Project Background

The proposed project is a mixed-development, which is being developed in 14 phases. The project comprises the construction of:-

Phase A – 1 Block of 3-storey shophouse (10 units)

Phase B – 3 Block of 3-storey shophouse (30 units)

- 1 Plot of SESCO substation

Phase C – 6 Block of 4-storey apartment (144 units)

- 1 Multi-purpose Hall

- 1 Plot of SESCO substation

Phase D – 1 Plot Community Centre

- 1 Plot of Football Field & open space

Phase E - 8 Block of Low-cost Terrace House (80 units)

- 3 block of Normal Housing (23 units)

Phase F - 14 Block of Low cost Terrace House (101 units)

- 1 Plot of Open Space

Phase G – 6 Block of Normal Terrace Houses (45 units)

Phase H – 6 Block of Normal Terrace Houses (60 units)

Phase I – 13 Block of Semi-Detached Houses (26 units)

- 4 Block of Normal Terrace Houses (37 units)

Phase J – 12 Block of Semi-Detached Houses (24 units)

- 4 Block of Normal Terrace Houses (40 units)

Phase K – 11 Block of Semi-Detached Houses (22 units)

Phase L - 17 Block of Semi-Detached (34 units)

Phase M - 1 Block of Detached Houses (1 unit)

- 32 Block of Semi-Detached Houses (64 units)

- 1 Plot of SESCO substation

Phase N – 1 Block of Detached Houses (1 unit)

- 12 Block of Semi-Detached Houses (24 units)

1.1 Specific Focus Of This EIA Study

Having examined the available information on the site and the proposed activities associated with the development of the project, this study will specifically focus on the following main concerns:

- a) Sewage Treatment and disposal.
- b) Collection and disposal of Solid Waste.
- c) Traffic condition – associated with the additional traffic load.
- d) Water Quality.

1.2 Urban Growth

During the last few years, there has been a tremendous (development) pressure in the built up areas within the city centre, which have resulted in a general shift in the development pattern from the inner-city centre to the so-called urban

periphery. The development projects that have contributed to this growth patterns includes:-

Tabuan development area – encompassing Tabuan Jaya, Tabuan Desa, Tabuan Height, Tabuan Laru, Muara Tabuan and Setutong.

Stampin area – including Taman BDC, Kpg. Cemerlang, Green Height and Pelita Height.

The Medan Raya and Megamall Project in Petra Jaya. These projects will relief some of the development pressure from the Kuching Business District.

The Batu Kawa Township – it will be a catalyst for future expansion.

Matang Area – including Matang Jaya, Taman Malihah and the proposed BDC – Matang mini-township.

The development of the proposed project complies with the planning strategies for distributive growth that would ease the development pressure in the city centre.

1.3 Population Growth

The population of Kuching City, based on the 1991 census was 277,905 person, which is an increase of approximately 300% from 72,555 person in 1980. This figure is approximately 75% of the district's population; indicating an average growth rate of 2.6% per annum for the period from 1980-1991. Thus assuming an average growth rate of about 3% per annum, the recent Kuching Urban and Regional Study (KURS) indicated that the district's population would be 650,000 people in the 2020 (Jabatan Perancang Bandar & Desa).

With the given scenario, housing supply forecast based on an average household size of five (5) is calculated to be 96,000 houses in the year 2000 and

160,000 units by the year 2020 from the 73,000 habitable stocks in 1991. Thus, Kuching City is in dire need to expand the supply of its housing stocks especially to cater for the middle and lower income families (Jabatan Perancang Bandar & Desa).

CHAPTER 2

PROJECT DESCRIPTION

2.1 Project Location

The proposed project site is located on Lot 704, Block 233, Kuching North Land District at Mile 6½, Jalan Penrissen, Kuching. The site is approximately ten kilometers from the Kuching City centre and about 800 meters due West of Kuching International airport. The locality plan for the proposed site is given as **Figure 2.1**.

2.2 Project Components

The proposed project has been designed to meet the aspiration of the buying public by providing a conducive living environment for the residents. This can be seen from the breakdown and distribution of the various components, to provide various types of residential and commercial units. The physical facilities associated with the project & can broadly be divided into two basic components namely:

- ✦ Residential Housing
- ✦ Commercial Units

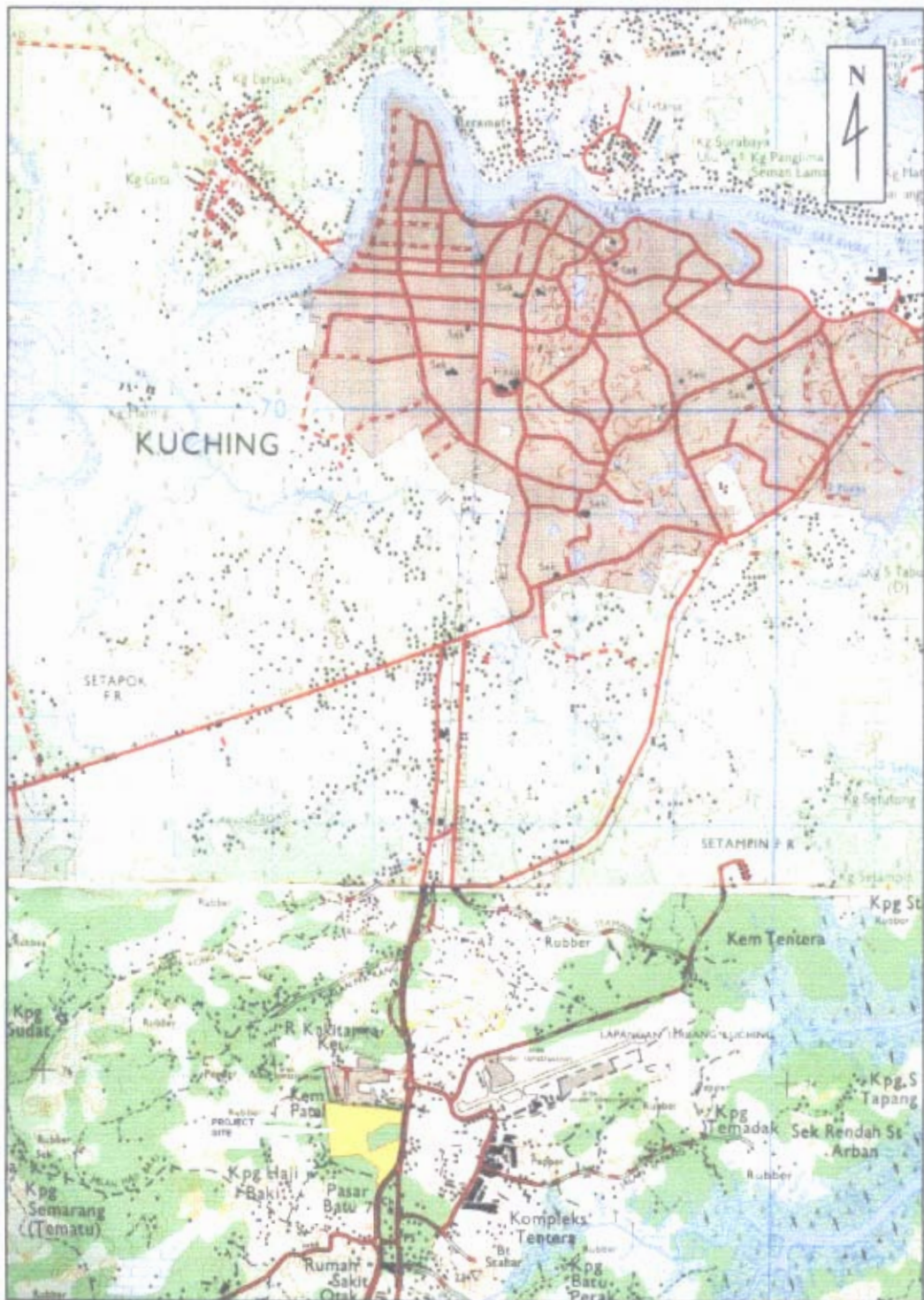


Figure 2.1 Project Location

2.2.1 Residential Housing

The proposed project has been designed to provide the following categories of houses:

No.	Type of House	No. of Units
1.	Double-Storey Terrace Houses	182 units
2.	Semi-Detached Houses	194 units
3.	Detached Houses	2 units
4.	Low cost Terrace House	204 units
5.	4-Storey Apartment	144 units

The different categories of houses are designed to cater for the housing needs of the various income groups. The different types of residential units were incorporated into the project design to encourage the integration of society through public interaction while utilising the common public facilities.

2.2.2 Commercial Units

The commercial component of the project comprises:-

- 3 Storey Shophouses (40 units)

The commercial components, notably the commercial outlets, was designed to facilitate the establishment of sundry shops to cater for the daily needs of the community by ensuring adequate supply of all the basic daily necessities.

2.2.3 Infrastructure And Utilities

The basic utilities such as treated water supply, telephone and electricity lines are immediately available. However, the relevant authorities should be given adequate notice of the project's requirement, to enable the relevant agencies to make the necessary preparation or upgrading works to meet the additional demand posed

by the project. The infrastructure and utilities such as the road and drain reserves, open spaces and the SESCO sub-stations will be surrendered to the state free of all cost following the completion of the project.

The development is relatively dense with an approximate population equivalent of about 2,700 PE, which is to be expected of a mixed development. Therefore it is essential to ensure that the relevant infrastructures are in place and the basic utilities are available if the development is to function as expected.

Electricity

Electricity for the proposed project will be connected from the existing electrical mains in the vicinity of the project. The electrical line is connected to the grid network of electricity supply in the state via the SESCO sub-station, which have been designed for the project.

Treated Pipe Water Supply

Treated pipe water will be supplied to the project via the existing water supply pipeline supplying the area.

Telecommunication

Telephone and facsimile lines are available in the area. The relevant authorities will have to be informed in advance so that the necessary upgrading works could be implemented in tandem with the project development. This is to ensure that unnecessary disruptions, for example due to line congestion etc., to the existing users is minimized. Based on the progress of the first two phases, there should be no problem in procuring the services.

Sewage and Solid Waste Management

The project has been designed to utilise independent septic tanks for the treatment of the sewage. The septic tanks will be equipped with overflow pipes, which will be connected to the monsoon drain.

Solid waste generated by the project will be managed by making prior arrangement with the municipal council to regularly collect and dispose of the household garbage. The commercial outlets will be provided with special receptacles to collect the solid waste generated by the individual commercial units. The municipal workers will be responsible for the disposal of the collected waste at the municipal's approved dumpsite.

CHAPTER 3

EXISTING ENVIRONMENT

3.0 Introduction

A description of the existing environment is essential to establish the prevailing environmental condition at the site. This will facilitate the environmental impact assessment process because the prevailing environmental characteristic will be used as the baseline for the assessment exercise. In consideration of the above-mentioned need the description of the existing environment will be sub-divided into three sections, namely:-

- ⊕ The Physical Environment,
- ⊕ The Human Environment

3.1 Physical Environment

The proposed project covers an area of approximately 27.842 hectares (68.797 acres). The site is approximately ten kilometers from Kuching City centre.

3.1.1 Topography and Soil

The topography of the Kuching Region generally comprises low-lying and relatively flat land. The proposed project site is located at the outer perimeter of Kuching City, within the hilly and upland tracts. The site is on elevated ground within the 20-50 feet contour level with flat to gently undulating summits.

Based on the detailed-Reconnaissance Soil Map of Sarawak, (see **Figure 3.1**) the original soil characteristic at the site comprise basically of low land podzols ranging from Miri Family and Buso Family.

3.1.2 Geology

Kuching City is located near the boundary of Sarawak's coastal plain and its upland hills and mountains. Like most of the coastal towns, the Kuching area can be divided into at least four main geological provinces within the Quaternary Deposits, namely:-

- ✦ The Paludal deposits resting on the estuarine deposits and residual soils.(Mangrove Swamp)
- ✦ Riverine deposits on paludal deposits and estuarine deposits (or Peatlands)
- ✦ The estuarine/deltaic deposits (Alluvial lowland)
- ✦ The residual deposits resting on bedrock (Hillsides and Uplands)

These provinces are formed as a result of a combination of riverine and deltaic conditions that existed throughout the last 5,500 years in the Kuching area. This is associated with the rising and falling of sea level, which have resulted in the development of a heterogeneous and complex set of generally weak and compressive soils of substantial thickness. These soils cover about 80% of the Kuching area while rocks from other varieties of geological formations underlie the rest.

The project site, located on the hilly upland tracts, is part of about 15.5% of the total land area within Kuching City, which is more than 25m above sea level.

The hilly upland tracts of Kuching and most of Kuching South are mostly underlain by the Tuang Formation, which generally consist of slate, phyllite and metagraywacke (see **Figure 3.2**).

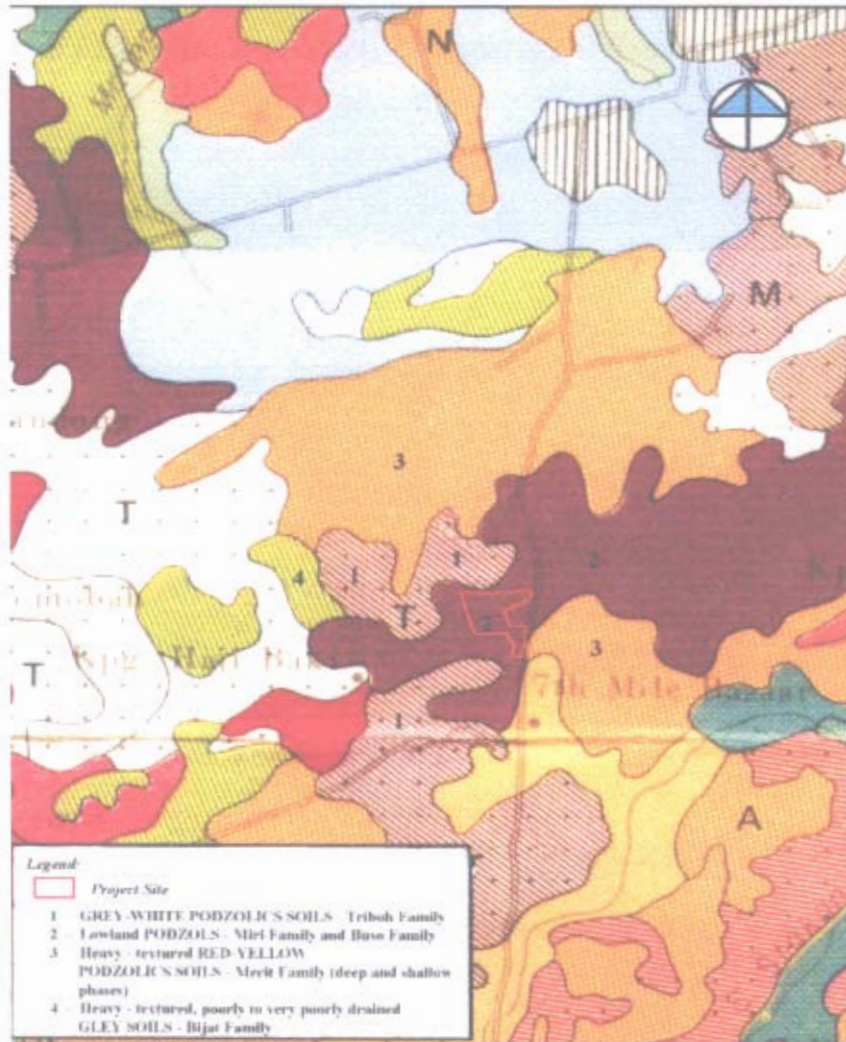


Figure 3.1 Soil Map of The Project Site

3.1.3 Hydrology

The general area is drained by a combination of natural gullies and drain network, which eventually drains into Sg. Semengoh. The project site is drained by the network of internal drains and perimeter drains which slopes generally eastwards, discharging into a road side monsoon drain site. The monsoon drain eventually

drains into Sg. Semengoh. Likewise, the developed areas in the vicinity of the project site, are equipped with a comprehensive network of drains, which is channeled into the monsoon drain. The later flows into the primary stream, flowing generally eastwards into Sg. Semengoh. Sg. Semengoh generally flows northwards, to form Sg. Kuap before draining into South China Sea.

3.1.4 Water and Water Quality

Water is an essential resource that sustains life. It is vital for many human activities, including agriculture, domestic and industrial use, transport and recreation. Developments, depending on their nature and size, have considerable potential to pollute hydrological systems resulting in a wide variety of hydrological impacts – many of which affect people directly. Consequently, water quality is the subject of much legislation and is one of the important issues in EIA studies.

Water quality in the environment is never pure, and natural waters vary considerably in the range and concentrations of dissolved substances present. They also differ in terms of variables such as suspended particulate, pH and temperatures. The water quality in the vicinity of the project site was determined by taking water samples from two points (see **Figure 3.3**) in the vicinity of the project.

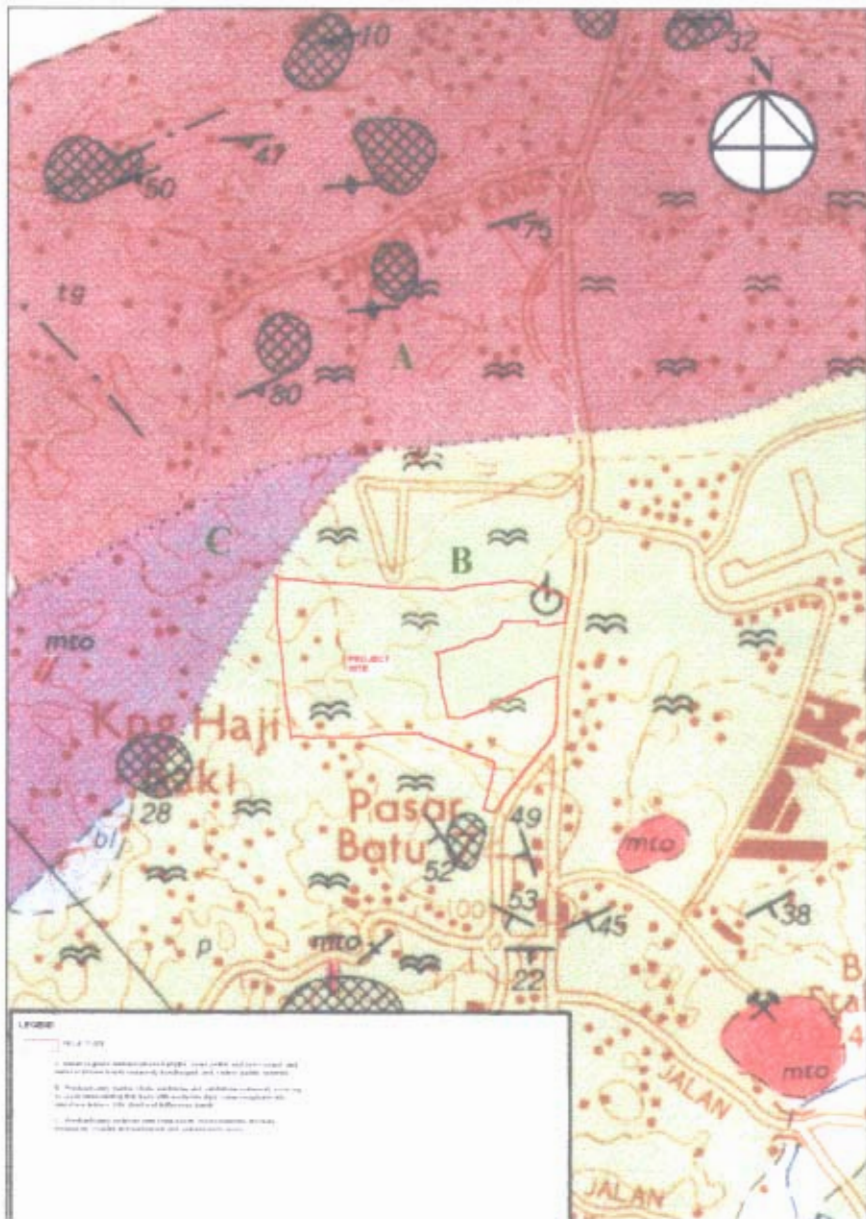


Figure 3.2: Geology Map of the Project Site