

CHAPTER 1
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1.1 General introduction

The development of road construction sectors expanded rapidly in the late 1980's as a result of the high demand of road users in line with the economic growth. The Malaysian government is committed in providing comfortable road network system for its people. However road development that utilizes resources and construction activities, if not planned with the environment in mind, would give rise to environmental problems such as, deterioration of water, air and land quality. Therefore, the aim of the research is to study environmental management aspects for the construction of re-aligned road of Federal Route 55 (Kuala Kubu Bharu to Frasers Hill) and to present the pollution control measures or a management system to abate the significant impacts on the environment. As a result, a management system of ISO 14001 needs to be established to ensure compliances to the Environmental Quality Act 1974 and DOE approval conditions for the project. This study will only concentrate on the physical parameters such as land, water, air and schedule wastes and solid waste management during the construction of the re-aligned road.

1.2 Background of the project

1.2.1 Development of Selangor River dam and the associated re-alignment road to Frasers Hill

The Selangor River dam, which is under construction, is straddled across the Selangor River near Kg. Gerachi at km 66.5 of Kuala Kubu Bharu road to Frasers Hill. The dam is of 110m high rock filled embankment type, located within the Hulu Selangor Forest Reserve in the Hulu Selangor district. Its reservoir has a surface area of approximately 600 ha, which is about 3% of the total catchment area of 19,700ha. The development of Selangor River Dam would affect the public road (Federal Route 55) from Kuala Kubu Baru leading to Frasers Hill, at the stretch where the dam and its reservoir is runs parallel to the proposed Selangor River Dam site. Therefore, there was a need to direct and construct a new re-aligned road of Federal Route 55, at about 1.5 km west of the proposed dam site to reach Frasers Hill.

1.2.2 Detail of the re-aligned road of FR55

The new re-aligned road is begins about 4 km from Kuala Kubu Bharu towards Frasers Hill in the Hulu Selangor district. The proposed dam and re-aligned road layout plan are shown in **Figure 1.1**. This re-aligned road will skirt the perimeter of the reservoir and rejoin the existing road at about 11 km from the Kuala Kubu Bharu town towards Frasers Hill. The total length of the re-alignment road is about 7.7 km. Two bridges will be constructed over Selangor River and Luit River along the new re-aligned road and the length of each bridge is about 200m. The design of the realigned road was constructed according to Public Works Department Malaysia (JKR)'s R3 standard, with a high geometric standard and safety devices such as guardrails.

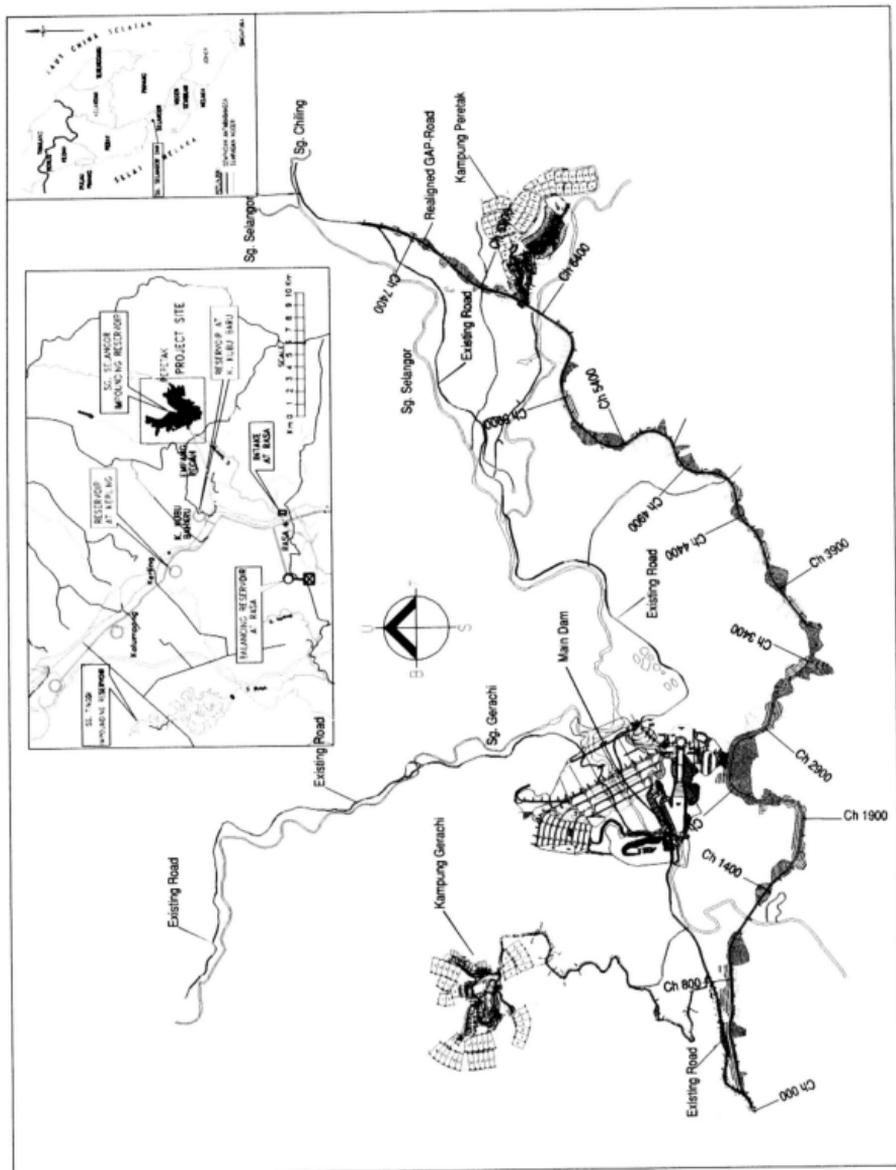


Figure 1.1: The location of Re-aligned Road of Federal Route 55 (Kuala Kubu Bharu – Frasers Hill)

The project proponent for the development of Selngor River Dam is Syarikat Pengeluar Air Sungai Slangor Sdn Bhd (SPLASH). The construction schedule for the re-aligned road was 15 months, from June 2000 until August 2001.

In Malaysia, the development of Selangor River Dam project and a reservoir of about 600 ha in surface area, falls under the Water Supply category, item 19(a) of the Schedule of Prescribed Activities in the EIA Order 1987. The specific guidelines, which have also been developed for this prescribed activity, are the "EIA Guideline for Dams and Reservoir project" and "EIA Guideline for surface water supply project". Therefore, a detailed Environmental Impacts Assessment (EIA) report for the re-aligned road of FR55 is required to be submitted to the Department of Environment (DOE), Malaysia for approval prior to commencement of this project (Konsortium TSWA-Gamuda-KDEB, 1999). The Department of Environment (DOE), Malaysia, has given its approval on 16th June 1999 through its letter of approval AS 50/013/201/013 Jld 2 (105).

The primary environmental objectives when constructing this re-alignment road project, which would bring benefits to the project proponent (SPLASH), are as follows:

- To manage environmental impacts arising during construction activities,
- To ensure the effectiveness of environmental protection measures identified in the EIA report, and
- To ensure project compliance with legislative requirements, Department of Environment (DOE) approval conditions and other requirements stipulated by other Government agencies associated with environmental matters.

1.2.3 The existing environment of the project area

In general, the project area lies within the lowland forest type, which covers low undulating country and hills rising up to 230-m altitude. The proposed re-aligned road areas are presently covered with logged over forest, orchards and rubber plantations. The forested area within the project site had been logged over during the period between 1961 to 1970. The ambient air quality at the proposed project site is good due to its location within an essentially natural and undisturbed environment, surrounded by secondary and primary forest area. Noise levels are generally low and present water quality assessment indicates a general Class II water quality for Selangor River, in the vicinity of the project area (Konsortium TSWA-GAMUDA-KDEB, 1999).

1.3 Project activities and its environmental impacts

With the existing hilly terrain, it is envisaged that the construction of the re-alignment road project would cause significant environmental impacts from the following activities:

- Site clearing and earthworks for cutting and filling of slopes along the re-aligned road of FR55
- Bridge construction to connect the re-aligned road over Selangor River and Luit River, such as micro-piling and grouting works; civil and structure works; beam launching, etc.
- Disposal of biomass such as trees, bushes and its branches, generated from the site clearing activities,

- Disposal of construction waste and scheduled wastes such as formworks, used oil etc. during construction phase generated from the civil and structure works and vehicle maintenance yard respectively,
- Rock quarrying and rock crushing to supply construction materials such as rock and aggregates for the road construction,
- Opening of borrow areas to supply earth for the road construction
- Concrete batching to supply concrete and cement for the road construction
- Transport of construction materials such as aggregates, rock, earth, concrete, cement, etc.
- Rock blasting at rock quarrying area and at certain chainages of the re-aligned road

The location of the above activities, which are closely associated with active areas such as road construction site, quarry site, site offices, canteens, workshop, central labour quarter, concrete batching plant and laboratory, are shown in **Figure 1.2**.

Environmental impacts can occur at the various stages of road development, from construction right down to maintenance stages, if adequate mitigation measures are not taken. Environmental issues depend on the activities undertaken during implementation and the sensitivity of the project site. The development of the re-aligned road of FR55 being on the highlands and hill slope area would differ entirely from the development on flat land or coastal areas. The most damaging impact normally occur during the

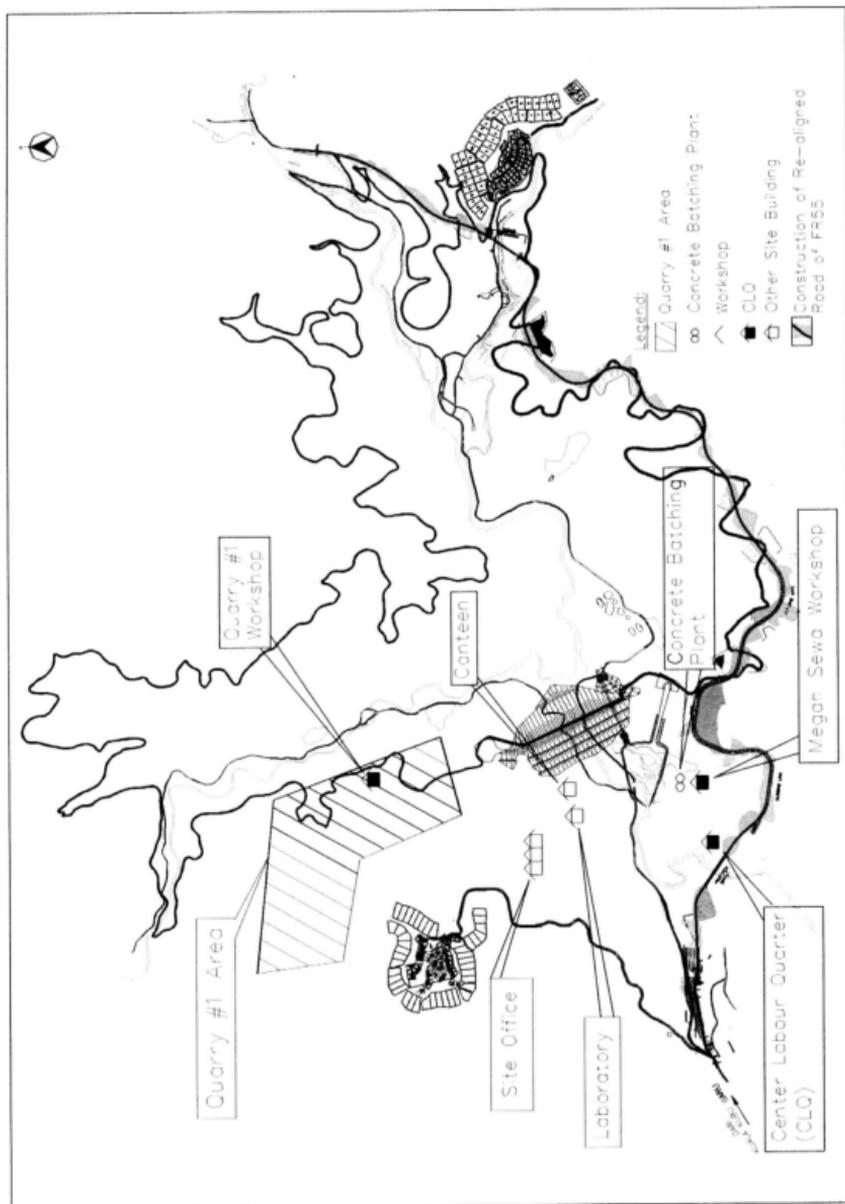


Figure 1.2: The locations of activities that associated with the road construction within the project site

construction stage. The significant environmental impacts on the environment caused by the construction activities, have been identified as follows:

- Soil erosion and siltation,
- Increased runoff and flooding
- River water quality,
- Air quality,
- Noise level,
- Ground contamination and
- Ground vibration intensity.

1.4 Environmental Management Systems

The project proponent, Syarikat Pengeluar Air Sungai Selangor Sdn Bhd (SPLASH) can take to advantage the application of a sound environmental management system to help protect human health and the environment from the potential impacts of its road construction activities and assist in maintaining and improving the quality of the environment. An Environmental Management Systems (EMS) offers a structural and systematic method to incorporate environmental care in all aspects of business including road construction. An EMS is part of an overall management system, which essentially includes strategic planning activities, organizational structure and implementation of the environmental policy (UNEP, 1995). The EMS also includes an auditing program and periodic management review, reflecting a commitment to continual improvement of the EMS (Yeoh *et al.*, 1996)

The potential benefits associated with an effective EMS include the following: -

- Identify and control relevant environmental effects, aspects, impacts and risks,
- Achieve its environmental policy, objective and targets, and
- Identify relevant environmental opportunities.

Nevertheless, there are a few problems or challenges in implementing environmental management. These moreover, can be easily or appropriately analyzed on the basis of a single criterion. Frequently there are non-quantifiable parameters that should be considered in the evaluation of alternatives (Wei, 1996):

1.5 Environmental requirements

Selangor River is located on the left hand side (LHS) of the new aligned road. It is envisaged that the construction activities with the hilly terrain involved, may cause significant impacts to the natural environment. Therefore, the project proponent, SPLASH was required to comply with the following standards and acts stipulated by the Malaysian's Government during the construction activities of the re-aligned road project: -

1. Environmental Quality Act 1974 (Act 127);
2. Environmental Quality (Clean Air) Regulation, 1978;
3. Environmental Quality (Sewage and Industrial Effluents) Regulations, 1979;
4. Environmental Quality (Motor Vehicle Noise) Regulations, 1987;

5. Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order, 1987;
6. Environmental Quality (Scheduled Wastes) Regulations, 1989

In addition, to the above standards and acts, the Department of Environment (DOE), Malaysia also stipulated additional terms and conditions during the construction of the re-aligned road. These terms and condition are shown in **Table 3.1** in Chapter 3.

1.6 Main objectives of study

The main objective of this study is to examine the environmental management system and planning for the re-alignment road project, which include:

- Identification of potential, significant environmental impacts caused by the various construction activities and development of mitigation measures to abate the environmental impacts raised, and
- Development and design of a preliminary Environmental Management Systems (EMS) for the project in line with the principle of ISO 14001, (focusing only on physical parameters).