RMIT INTERNATIONAL UNIVERSITY VIETNAM
INITIAL ENVIRONMENTAL EXAMINATION

MARCH 2000

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ABBREVIATIONS

ANZECC	Australian and New Zealand Environment and Conservation Council
BOD	Biological Oxygen Demand
CBD	Central Business District
CFC	Chlorofluorocarbons
COD	Chemical Oxygen Demand
DOSTE	Department of Science, Technology and the Environment
EIRR	Economic Internal Rate of Return
EPA	Environmental Protection Authority
FIRR	Financial Internal Rate of Return
HCMC	Ho Chi Minh City
HPPC	Hiep Phuoc Power Company
IEE	Initial Environmental Examination
MASD	Management Authority South Saigon Development
MOSTE	Ministry of Science, Technology and the Environment
MPI	Ministry of Planning and Investment
NEPL	National Environmental Protection Law
OH&S	Occupational Health and Safety
O&M	Operations and Maintenance
PAP	Project Affected Person
pH	Logarithm of the reciprocal of the hydrogen ion concentration
PHC	Phu My Hung Corporation
PM	Particulate Matter
RAP	Resettlement Action Plan

RL	Reduced Level
RMIT	Royal Melbourne Institute of Technology
SS	Suspended Solids
TAFE	Technical and Further Education
TDS	Total Dissolved Solids
THC	Total Hydrocarbons
TPH	Total Petroleum Hydrocarbons
TPH	Total Petroleum Hydrocarbons
TSC	Trung Son Company Ltd
VESDEC	Vietnamese Association for Conservation of Nature and the Environment

CHAPTER 1
INTRODUCTION

1.1 General

The RMIT International University is to be established in Ho Chi Minh City (HCMC) on a site within the Saigon South Development. An Initial Environmental Examination (IEE) is required to determine whether or not significant environmental impacts warranting assessment are likely. If a full Environmental Impact Assessment (EIA) is not needed, the IEE will be considered as the final environmental assessment.

This IEE has been prepared in accordance with the Environmental Assessment Requirements of the Asian Development Bank 1998.

The IEE includes:

- A brief description of the proposed RMIT International University Vietnam;
- A description of the area affected by the Project;
- Assessment and prediction of the main potential impacts of the Project on the surrounding environment;
- A description of an Environmental Management Program including measures to mitigate impacts and monitoring programs.

1.2 Legal Framework

The legal framework for environmental management in Vietnam is based on the National Environmental Protection Law (NEPL). The Ministry of Science Technology and Environment (MOSTE) is responsible for the implementation of NEPL at the national level. The Departments of Science, Technology and Environment (DOSTE) are responsible at the provincial level.

The relevant Vietnamese documentation in relation to environmental assessment is:

- The National Action Plan for Environment and Sustainable Development, prepared by the National Committee for Science, SIDA, UNDP, IUCN, approved by the Prime Minister in 1991.
- The Law on Environmental Protection approved by the National Assembly of the Socialist Republic of Vietnam on 27 December 1993; issued according to the order 29-L/CTN 10 January 1994 of the State Chairman.
- Decree N^{o} 175/CP on 18 October 1994 issued by the Government for the guidelines on implementation of the Law on Environmental Protection.

- Vietnamese Standard of Environment, issued by the Ministry of Science, Technology and Environment (MOSTE) in 1995.
- Circular N^{o} 490/1998/TT-KHCNMT issued on 29th April 1998 by MOSTE[5] requiring content of an EIA study.

The Project will be undertaken within the framework of the Law on Foreign Investment in Vietnam and under specific regulations as agreed with the Government of Vietnam for the RMIT International University Vietnam.

The Project has been advised by the HCMC People's Committee that under MOSTE guidelines no reporting is required on environmental effects since this is considered to be an education project. The Committee has also advised that based on Item 2, Article 39 of the Decree No. 12/CP of 18 February 1997 on implementation of the Law of Foreign Investment in Vietnam, reporting on environmental effects is not required. However the investor is required to explain activities which may have environmental impacts, and to provide solutions and commitment to mitigate impacts during construction and operation. A translation of this advice is included as Appendix 3.

1.3 Extent of the Study

Details of references consulted are included in Appendix 1.

The IEE has been prepared by the following team:

Dr Madeleine Reeve:	Project Management
Ms Jill Byrne:	Project Management
Dr David Petch	IEE overview
Dr Robert Noakes:	Socio-Economic Impact
Meinhardt (Vic) Pty Ltd:	Initial Environmental Assessment
Bonacci Winward (Vic) Pty Ltd:	Infrastructure Assessment
Golder Associates:	Preliminary Geotechnical Advice.

Details of this Study Team are included in Appendix 2.

The Meinhardt team undertook an initial environmental assessment of the site in February 1999. This assessment involved:

- Inspection of the site;
- Collection and analyses of soil and water samples;
- Collection of information regarding site history, with emphasis on identification of possible sources of site contamination or pollution. This research involved a

review of the literature and discussion with those with knowledge of the site, including occupants of the site.

The Meinhardt Report is included as Appendix 4.

The Bonacci Winward team visited HCMC in January 1999 to assess infrastructure requirements as part of RMIT's Investment Licence application to establish a fully foreign owned university. Bonacci Winward enlisted the support of Norman Disney & Young (Services Consulting Engineers) and Golder Associates (Geotechnical Engineers) to provide specialist expertise in their respective disciplines.

The Bonacci Winward Report is included as Appendix 5.

Dr David Petch who is a specialist in environmental assessment reviewed the IEE. Dr Robert Noakes, who worked with the ADB as an Evaluation Specialist and Financial Analyst from 1991 to 1996, undertook the analysis of the socio-economic impact of the Project.

A Study Team in Vietnam led by Dr Le Trinh, Vice President of the Vietnam Association for Conservation of Nature and Environment (VESDEC), also prepared an IEE. During February 2000 the team undertook data collection, field surveys and analysis. That document is included as Appendix 6 and is referred to as the VESDEC Report in this document.

CHAPTER 2 DESCRIPTION OF THE PROJECT

2.1 General

RMIT University proposes to establish and, through a consortium of investors, operate RMIT International University Vietnam as a university of international standards, quality assured by RMIT. The objectives of the university are:

- To contribute to human resource development, employment, economic growth and ecologically sustainable development in Vietnam.
- To assist the skills formation, economic development and poverty alleviation of Vietnam and surrounding region.
- To strengthen higher education in Vietnam.
- To undertake research, development and innovation in collaboration with government, private sector, other universities and research centres, both in Vietnam and internationally.
- To provide teaching and learning programs at international standards through direct and remote means.
- To encourage community service, technical assistance and interaction with professional and industry groups.
- To operate the University within the legal and regulatory framework of Vietnam enabling appropriate returns to investors.

The University will provide a range of preparatory, undergraduate and postgraduate courses; short courses; English and Vietnamese language courses; study abroad programs and industry training. Qualifications will include Certificates, Diplomas, Associate Degrees, Bachelor, Master and Doctoral degrees.

The products and services will include training, consultancies, provision of conference facilities including hotel, research and development, and technology transfer. They will also include the provision of staff and student housing; retail outlets for the sale of educational products such as books and computers; food outlets; clinic; and other retail, recreational, residential and sporting activities operating as part of the campus to meet the requirements of students, staff and other clients.

The educational programs will be developed to reflect national needs and market demand. It is expected that programs will include:

- Undergraduate courses including Bachelor Degrees and possibly, Associate Degrees and Advanced Diplomas;
- Postgraduate programs by course work and research;

- Industry training, in-service and on campus;
- Industry innovation and research and development (R&D);
- English learning and Vietnamese language courses;
- Preparatory and Bridging programs;
- Study abroad (inbound and outbound) and transfer.

The University will operate throughout the full year with three 12-week semesters. Academic year intakes will be in January/February, June and September.

2.2 Category of Project

On the basis of the Asian Development Bank Guidelines this is a Category B Project. The IFC has determined that it is a Category A Project in terms of its environmental requirements.

2.3 Need for the Project

The University will be Vietnam's first truly international campus, contributing to the development of a large and rapidly growing market in South East Asia in one of the region's most dynamic cities, HCMC.

The Project is expected to contribute to providing Vietnam's workforce with the skills, competencies and qualifications required in an emerging and vibrant market economy. Human resources are Vietnam's primary resource in the modernisation and industrialisation process by which Vietnam is seeking to improve its standard of living, redistribute income to the benefit of all the Vietnamese people and develop its human capital for sustainable development.

The University will also provide Vietnam with a valuable model to assist Vietnamese educational institutions to develop appropriate flexibility in terms of course content, duration and methods of delivery.

This Project will provide a powerful combination of training, education and innovative research and development which will be closely geared to the needs of private industry, the government and the community. All programs will be delivered with a unique combination of Vietnamese and international staff, supported by technology including intensive online support and interactive television instruction.

The University will produce graduates, develop trainees and support technology clients who will be leaders in the fast changing global community. Benefits to students and clients include enhancing Vietnam's economy and growth prospects of the region.

2.4 Project location

The 62 hectare site within the Saigon South Development was reserved by the HCMC People's Committee for RMIT in March 1999. It is approximately 5 km south of central HCMC on the Eastern University Park in Development master plan. The Management Authority for South Saigon Development (MASD) will enter into the land lease with RMIT.

The location of the South Saigon Development is shown in Figure 2.1. The location of the site within the Development is shown in Figure 2.2.

The site boundaries are:

- The eastern boundary is adjacent to the planned North-South Highway (District Road 34);
- The western boundary is adjacent to the Ong Lon Stream;
- The southern boundary is adjacent to the Binh Thuan Road (South Saigon Parkway);
- The northern boundary is adjacent to the Bang Stream.

The Saigon South Development is Vietnam's largest urban development project, stretching some 17.8 km along either side of the new South Saigon Parkway. Currently two lanes, this road will ultimately be increased to ten lanes, linking the HCMC Port area with National Highway 1. The Saigon South Development comprises 2,600 hectares of land along the sides of the Parkway, with green barriers to the north and south. Phu My Hung Corporation (PMH) is responsible for the development of the South Saigon Parkway. PMH holds 600 hectares of developable land. The remaining 2,000 hectares is held by the HCMC Government (via MASD).

2.5 Size of the operation

The campus master plan for Stage 1 is included as Figure 2.3. The master plan for the total development is included as Figure 2.4.

It is anticipated that in the first year of operation the campus will have a population of approximately 2000 students, academic and support staff. By Year 10, this population is estimated to be approximately 9,000.

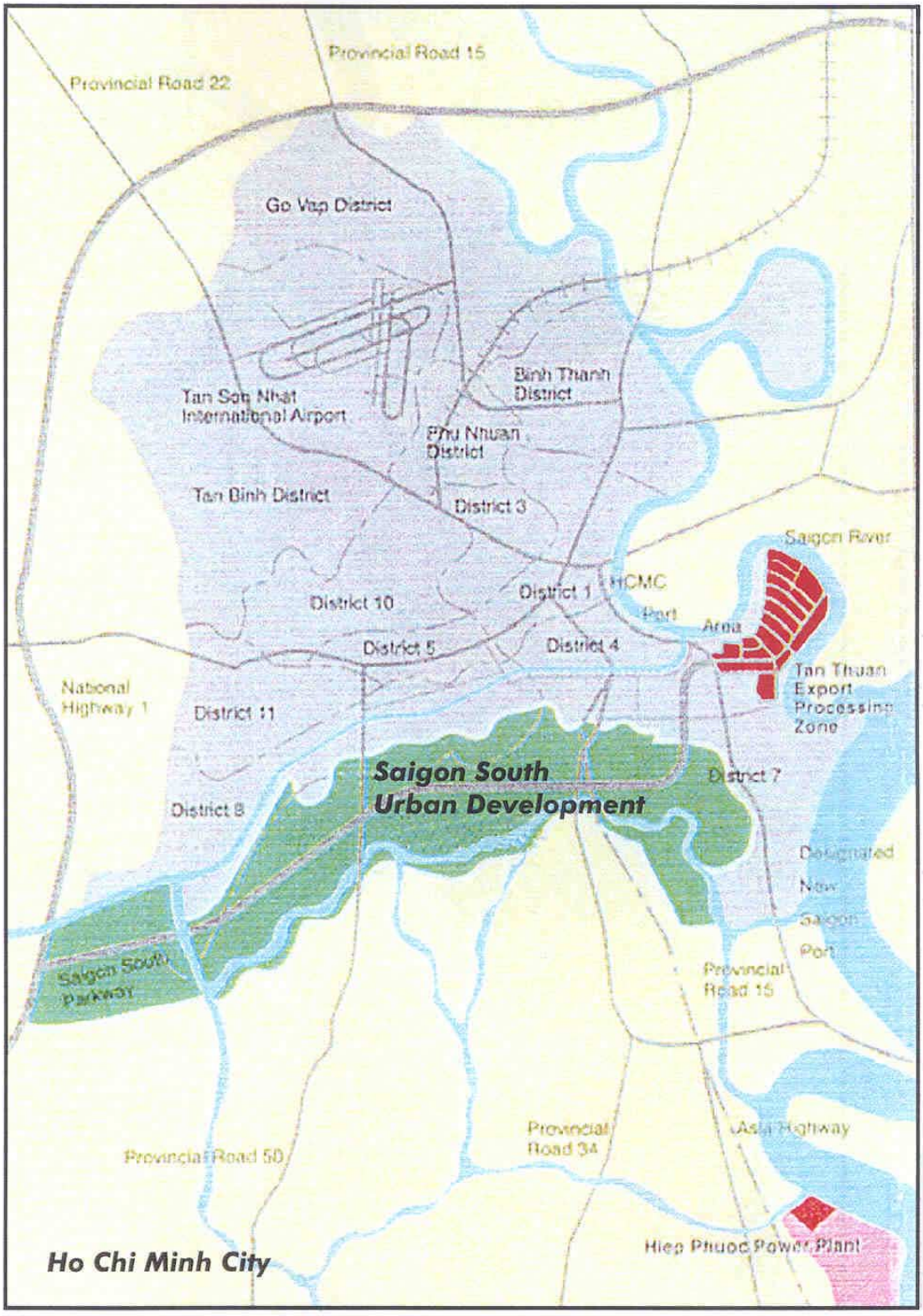
The master plan has been developed to enhance the existing estuarine environment of the site. The main nucleus of activity is situated on the central waterfront on the Ong Lon River. Natural vegetation will be preserved and additional vegetation will ensure ample natural surroundings. Enhancement will be achieved through the

construction of a series of connected walkways at an elevation of 1.5 to 2.0 m, and retention of the internal canal that meanders through the site. The main campus building and sports hall are located in the western portion of the site. A central pedestrian spine links the individual faculty buildings which are of a flexible building type.

An upgraded embankment doubles as a levee to the Ong Lon River, ensuring that the site is not flooded periodically. The levee has a proposed top level of 2.5m, with a spillway set at 2.2m to allow water to flow back to the Ong Lon River and prevent flooding of the site. The size of the spillway will cater for storms of more than 100 year return period.

The proposed fill platform for the campus buildings is a nominal 2.5m which is 0.15m above the level of the South Saigon Parkway. Building levels would then be at about 2.7m. Current available rainfall data indicate that this should mean that the buildings should not be subject to flooding.

As part of the approval process for the Zone Planning Certificate, the master plan has been approved by the HCMC People's Committee. The Zone Planning Decision (2 August 1999) provides details of the approved land use and proposed infrastructure. It is included as Appendix 7.



Location of Saigon South Urban Development in HCMC **Figure 2.1**

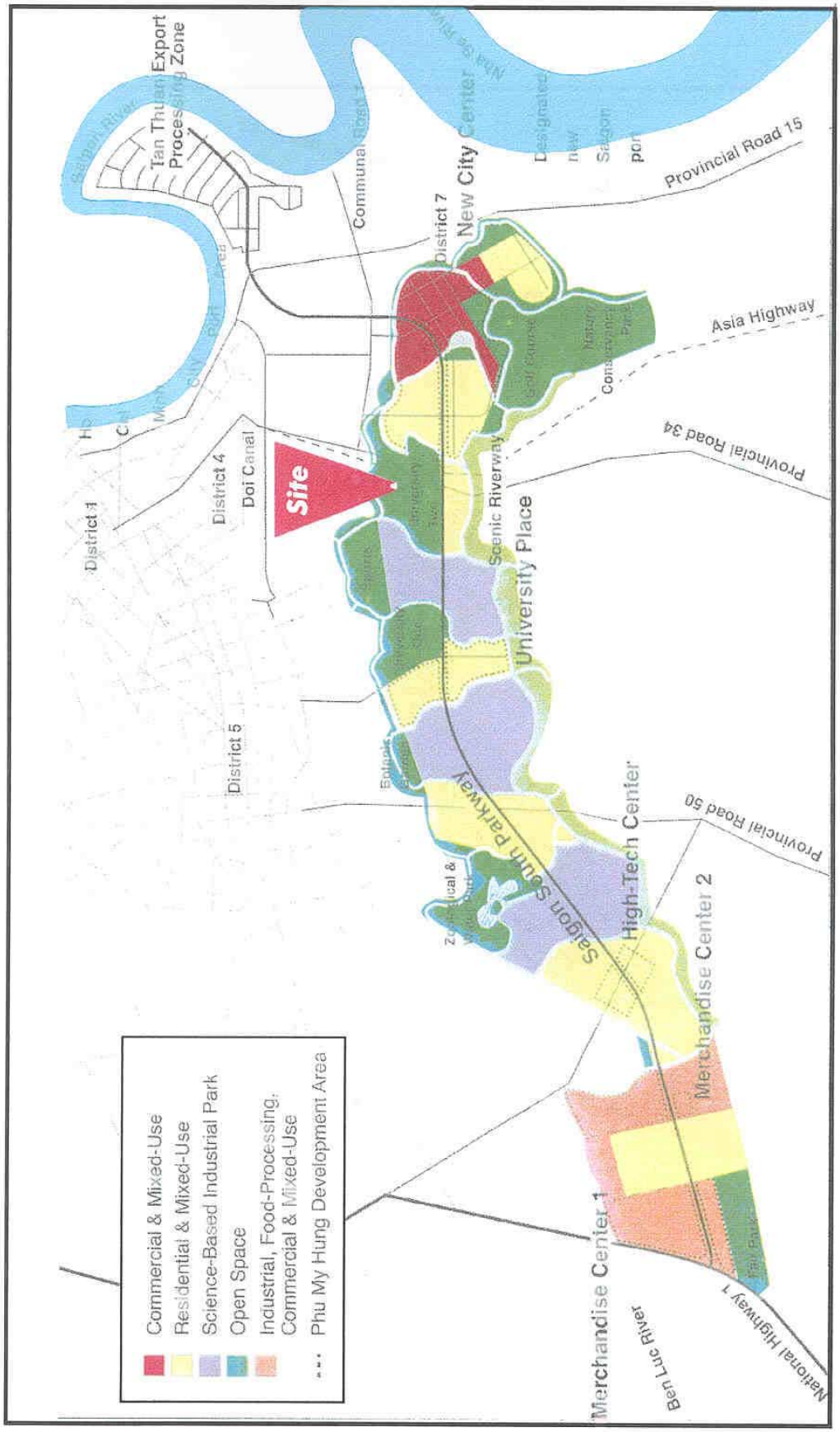
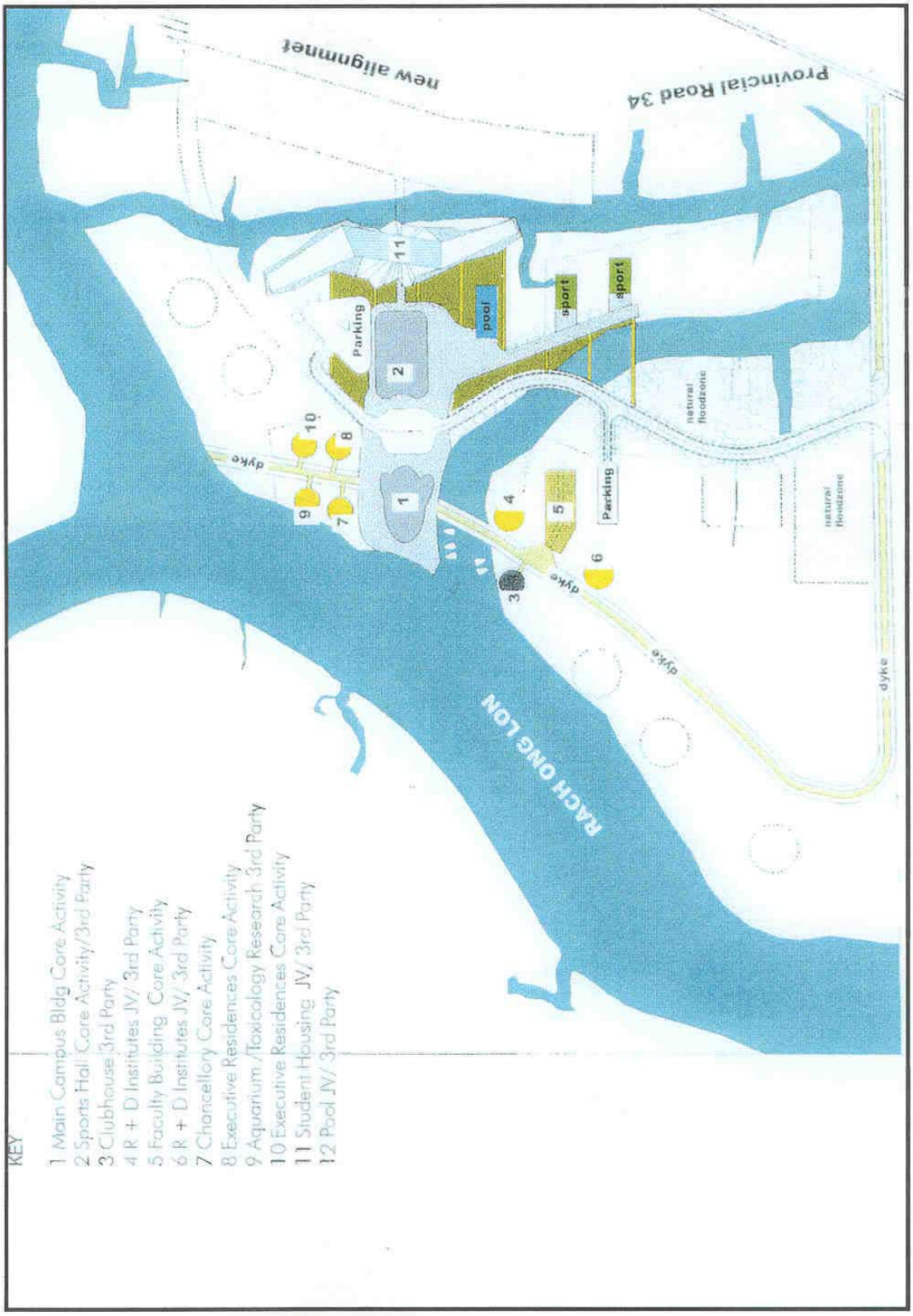
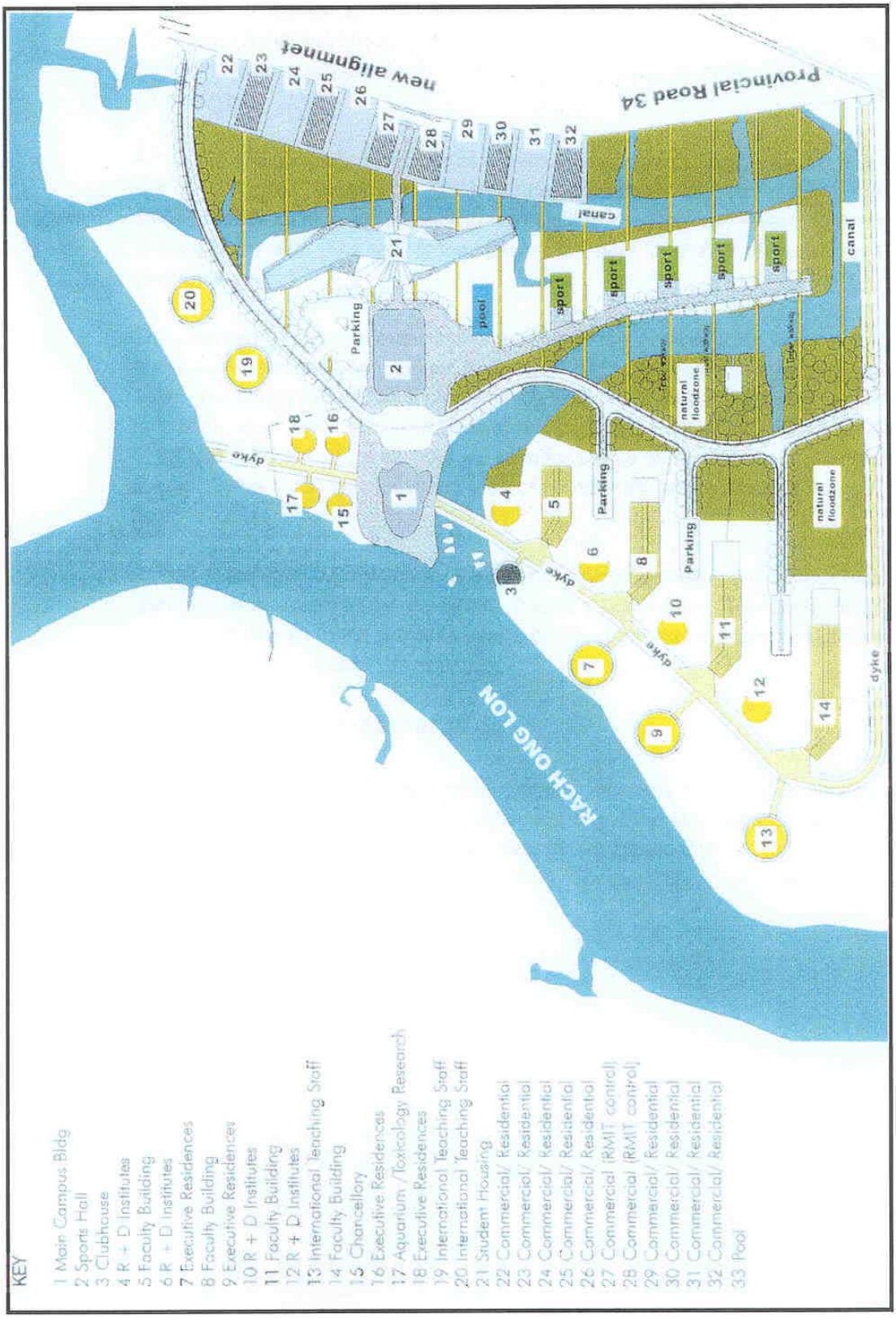


Figure 2.2

Site Location within Saigon South



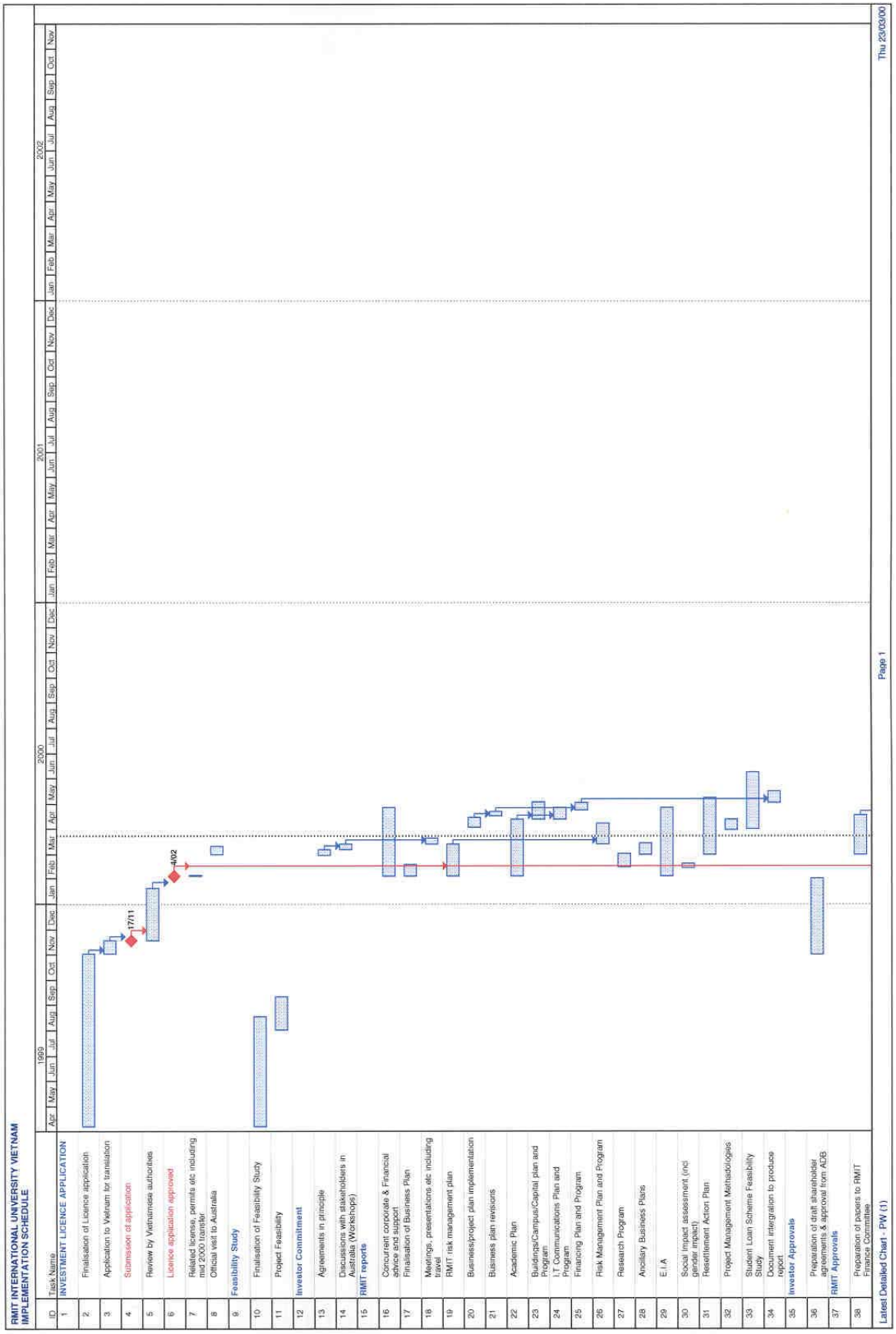
RMIT University Stage 1 Development ***Figure 2.3***

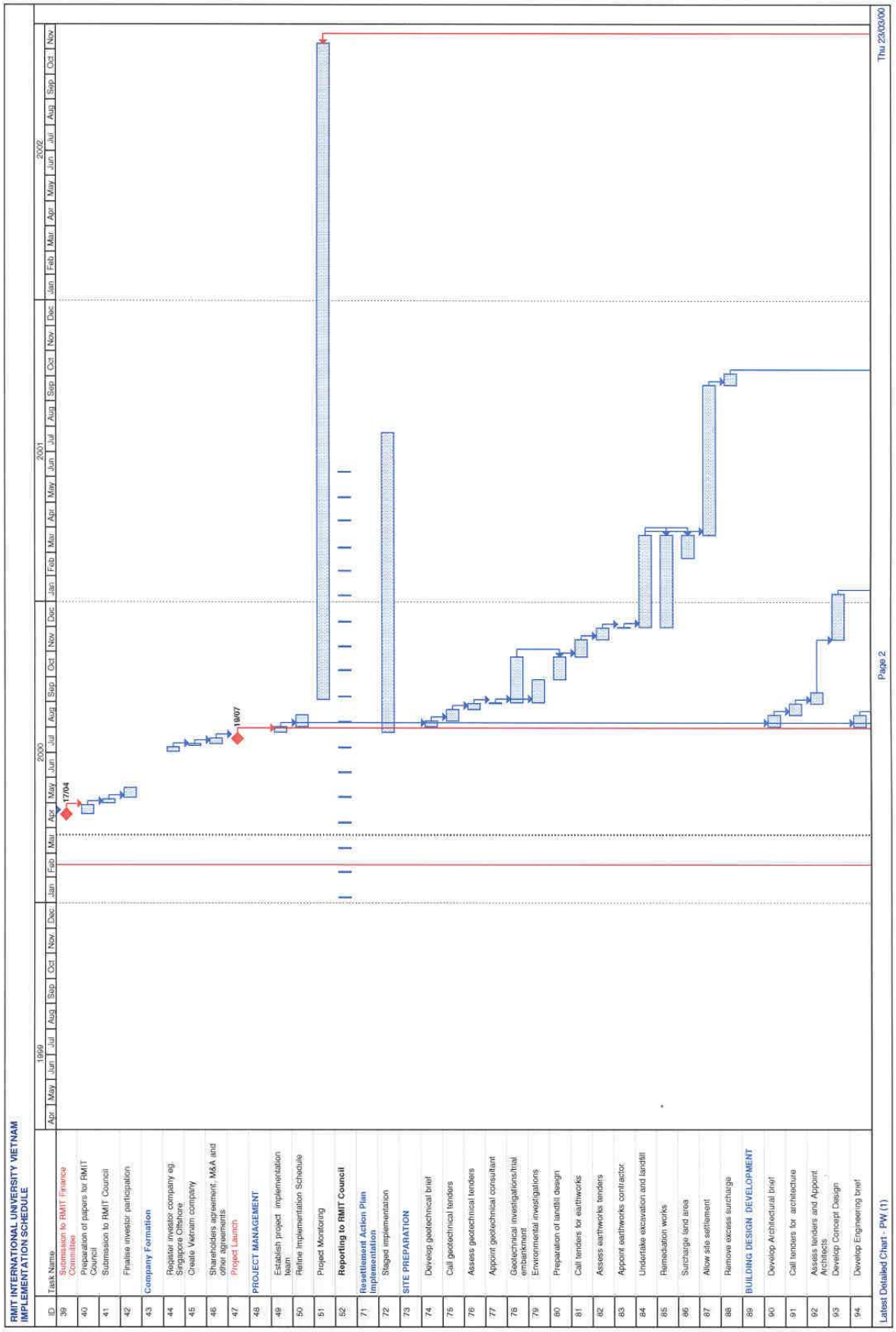


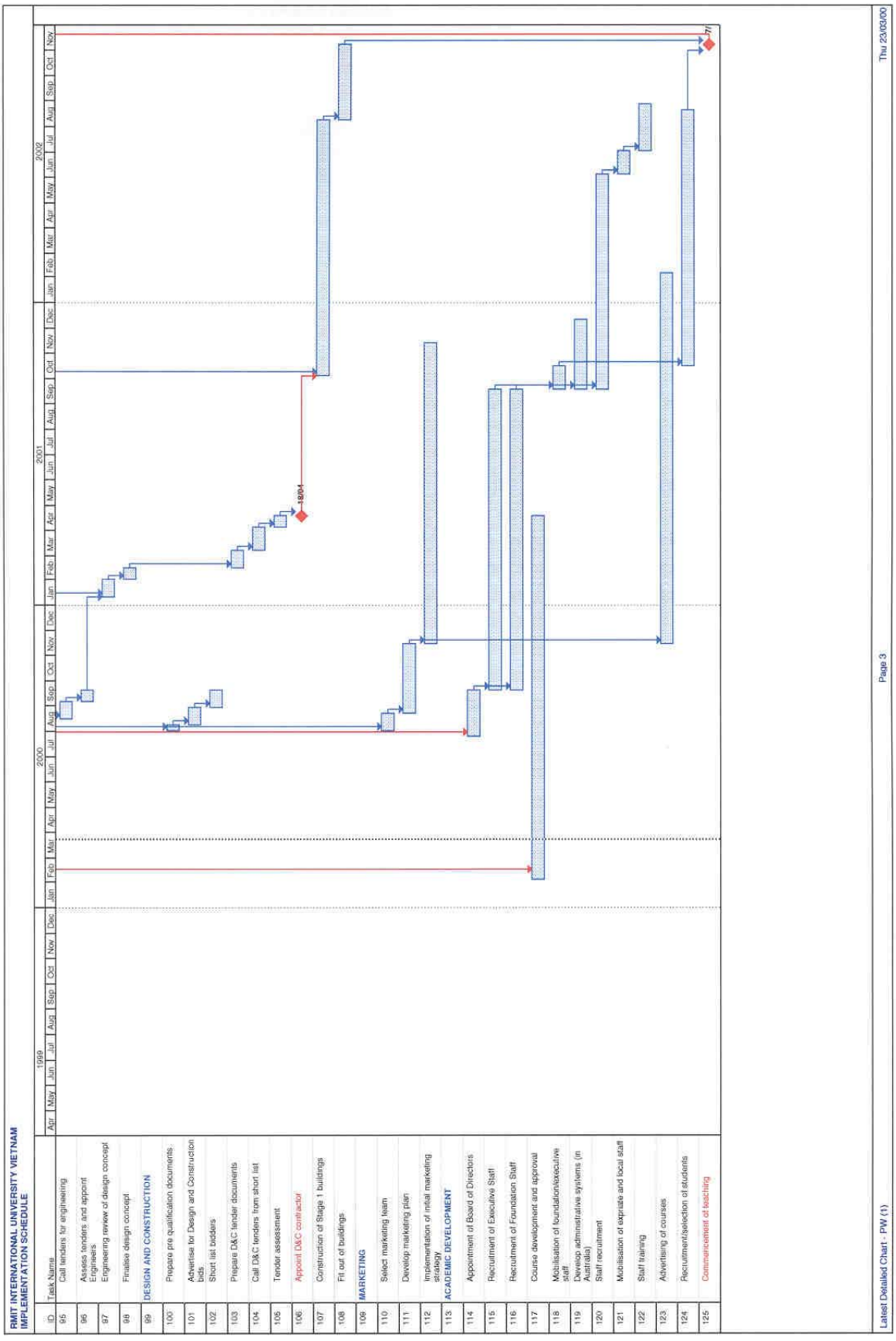
RMIT University Total Development ***Figure 2.4***

2.6 Project Implementation

The preliminary project implementation schedule indicates that site preparation will commence in Year 2001 with construction and fit out the first stage of the campus facilities to be completed by the end of Year 2002. Incremental development of the campus will continue until Year 2012. The preliminary schedule follows as Figure 2.5.


RMIT INTERNATIONAL UNIVERSITY VIETNAM
IMPLEMENTATION SCHEDULE
1999
2000
2001
2002
ID
Task Name
1 INVESTMENT LICENCE APPLICATION
2 Finalisation of Licence application
3 Application to Vietnam for translation
4 Submission of application
5 Review by Vietnamese authorities
6 Licence application approved
7 Related license, permits etc including mid 2000 transfer
8 Official visit to Australia
9 Feasibility Study
10 Finalisation of Feasibility Study
11 Project Feasibility
12 Investor Commitment
13 Agreements in principle
14 Discussions with stakeholders in Australia (Workshops)
15 RMIT reports
16 Concurrent corporate & Financial advice and support
17 Finalisation of Business Plan
18 Meetings, presentations etc including travel
19 RMIT risk management plan
20 Business/project plan implementation
21 Business plan revisions
22 Academic Plan
23 Buildings/Campus/Capital plan and Program
24 I.T Communications Plan and Program
25 Financing Plan and Program
26 Risk Management Plan and Program
27 Research Program
28 Ancillary Business Plans
29 E.I.A
30 Social impact assessment (incl gender impact)
31 Resettlement Action Plan
32 Project Management Methodologies
33 Student Loan Scheme Feasibility Study
34 Document intergration to produce report
35 Investor Approvals
36 Preparation of draft shareholder agreements & approval from ADB
37 RMIT Approvals
38 Preparation of papers to RMIT Finance Committee
17/11
4/02
Latest Detailed Chart - PW (1)
Page 1
Thu 23/03/00


RMIT INTERNATIONAL UNIVERSITY VIETNAM
IMPLEMENTATION SCHEDULE
1999
2000
2001
2002
Task Name
Submission to RMIT Finance Committee
Preparation of papers for RMIT Council
Submission to RMIT Council
Finalise investor participation
Company Formation
Register investor company eg Singapore Offshore
Create Vietnam company
Shareholders agreement, M&A and other agreements
Project Launch
PROJECT MANAGEMENT
Establish project implementation team
Refine Implementation Schedule
Project Monitoring
Reporting to RMIT Council
Resettlement Action Plan Implementation
Staged implementation
SITE PREPARATION
Develop geotechnical brief
Call geotechnical tenders
Assess geotechnical tenders
Appoint geotechnical consultant
Geotechnical investigations/trial embankment
Environmental investigations
Preparation of landfill design
Call tenders for earthworks
Assess earthworks tenders
Appoint earthworks contractor
Undertake excavation and landfill
Remediation works
Surcharge land area
Allow site settlement
Remove excess surcharge
BUILDING DESIGN DEVELOPMENT
Develop Architectural brief
Call tenders for architecture
Assess tenders and Appoint Architects
Develop Concept Design
Develop Engineering brief
17/04
18/07
Page 2
Thu 23/03/00
Latest Detailed Chart - PW (1)


RMIT INTERNATIONAL UNIVERSITY VIETNAM
IMPLEMENTATION SCHEDULE
ID
Task Name
1999
2000
2001
2002
Call tenders for engineering
Assess tenders and appoint Engineers
Engineering review of design concept
Finalise design concept
DESIGN AND CONSTRUCTION
Prepare pre qualification documents
Advertise for Design and Construction bids
Short list bidders
Prepare D&C tender documents
Call D&C tenders from short list
Tender assessment
Appoint D&C contractor
Construction of Stage 1 buildings
Fit out of buildings
MARKETING
Select marketing team
Develop marketing plan
Implementation of initial marketing strategy
ACADEMIC DEVELOPMENT
Appointment of Board of Directors
Recruitment of Executive Staff
Recruitment of Foundation Staff
Course development and approval
Mobilisation of foundation/executive staff
Develop administrative systems (in Australia)
Staff recruitment
Mobilisation of expriate and local staff
Staff training
Advertising of courses
Recruitment/selection of students
Commencement of teaching
Page 3
Latest Detailed Chart - PW (1)
Thu 23/03/00

CHAPTER 3
DESCRIPTION OF THE ENVIRONMENT

3.1 Physical Resources

3.1.1 Introduction

The total population of Vietnam is estimated to be about 78 million and population growth is currently estimated at about 1.8%. HCMC is Vietnam's largest city and major industrial centre, with a population of approximately 6 million people, most of whom live in the eighteen inner urban districts. The city is built on the banks of the Saigon River, which is a tributary of the Nha Be River which flows into the South China Sea, 50 km south of HCMC. The city is generally flat with much of the surrounding rural land used for rice culture.

3.1.2 Climate

The average annual rainfall is 1,979 millimetres, most of which occurs in the wet season from May to November. The average annual temperature is 27 degrees Celsius and the average humidity is 80%. Climatic details are provided in the following table.

Table 3.1 Data on climate at HCMC

	Jan.	Feb.	Mar	Apr.	May	Jun.	July	Aug.	Sept.	Oct.	Nov.	Dec.
Temperature °C	25.7	26.6	27.8	28.8	28.8	27.4	27.0	27.0	26.7	26.6	26.3	25.7
Moisture %	74	71	71	74	80	84	84	85	86	83	82	78
Wind Velocity M/s	2.5	2.8	3.2	3.2	2.7	3.1	3.1	3.3	2.8	2.5	2.3	2.2
Wind Direction	E	E	SE	SE	E	W	SW	W	W	W	N	N
Radiation Heat Cal/day	344	401	449	428	351	371	369	365	344	337	325	334
Precipitation mm/M	14	4	11	50	219	313	295	269	330	264	114	51
Evaporation mm/M	124.1	135.6	163.6	146.9	107.9	84.8	84.8	85.7	70.1	68.2	78.3	97.5

Source: DOSTE of Hochiminh City. Data collected from 1981 -1990

The wind velocity ranges from2.2 to 2.8m/s and the wind direction is dominant East or South East from January to May, W in June to October, and North in November to December.

3.1.3 Topography

The site for the proposed campus currently consists of wetlands and reclaimed agricultural land to the east of the Ong Lon River. Elevation of the site is approximately +0.8 m. The land is a part of a river delta system, and waterways through the site are of a tidal nature. At the North of the site, the area has been reclaimed for agriculture along the Ong Lon River and inland from the River. To the East of the site there is a small road with a high level of urban development along it.

3.1.4 Soils

The area is alluvial and subject to periodic flooding. The soils are uniform across the site consisting of a heavy blue-grey cracking clay with a high organic content. As part of the site assessment by Meinhardt (Appendix 4) the soil profile was tested to a depth of approximately 2.0 metres. This revealed that the profile was uniform to this depth, with some red mottling in waterlogged soils.

According to Dr. San Ha from the HCMC University, the area has very deep clay sediment, with bedrock more than 30 m below the surface level. At points of soil sampling, a hand auger was used to dig to depths of approximately 500mm. It was observed that all sample holes were waterlogged at their base.

Most "dry" land across the site is reclaimed land developed by draining and the excavation or importation of fill material to build paddy levees, pathways and areas for housing. The area is subject to periodic flooding. The rate of sediment scouring and deposition during periods of flooding is unknown. Paddy levee banks gradually sink and are periodically built up, mainly through sods being cut from the floors of paddies and piled onto the levees. This practice ensures some "recycling" of sediments, with material being excavated and brought to the surface. This may be significant in bringing historically contaminated sediment, if it exists, to the surface.

No evidence of pesticide or defoliant contamination was found in any of the soils sampled.

Many of the randomly selected soil samples were found to have levels of Sulphate that exceeded ANZECC Environmental Soil Quality Guidelines by very significant amounts. This sulphate is apparently naturally occurring, and may indicate the

presence of Acid Sulphate Soils. Such soils are typically waterlogged and anaerobic and when excavated or otherwise exposed to air can oxidise to produce sulphuric acid. This can impact on aquatic and marine ecosystems. Such soils need to be managed to avoid adverse environmental impacts. This can best be achieved by disposing of excavated soils into aqueous anaerobic environments. Acid Sulphate Soils are naturally occurring in some water environments and will not have an impact if deposited back to a similar aqueous environment.

Analysis also revealed that soils across the site were consistently acidic, with pH levels as low as 3.1. There are no limits for environmental or health investigation limits recommended for pH. The acid nature of the soil is likely to be caused by the high levels of organic material and the waterlogged anaerobic conditions of many of the soils, but may also indicate the presence of oxidising Acid Sulphate Soils. Water samples taken on the sites were all within the pH range of 6.4 to 7.1, indicating that the presence of acidic soils and high levels of sulphur were not making the water unacceptably acidic. The presence of acidic soils may have implications for the design of concrete building foundations, which will need to be able to withstand or be protected from corrosion.

Analysis of samples taken from potential “hotspots“ indicated isolated instances of heavy metal contamination. For example, fill material imported onto the site to build pathways was found to have high levels of lead, zinc and copper contamination.

River sediment samples were found to be free of significant levels of contamination, but did have elevated levels of Total Petroleum Hydrocarbons (TPHs), indicating pollution of waterways by fuels and oils.

Details of the results of the soil analysis are provided in Appendix 4.

3.1.5 Hydrology

The streams in the Project area are part of the Saigon - Dongnai river system. The waterways through the site are of a tidal nature.

As part of the development of the Saigon South Master Plan, Skidmore, Owings & Merrill commissioned the engineering firm of Woodward Clyde Consultants (WCC) to address hydrologic issues. The WCC study indicated that the hydrologic factors which influence flood and water quality issues in the area are tides, releases from hydroelectric projects on tributaries to rivers within the area, rainfall-runoff to channels and waste water discharges. Critical flood events in the Saigon South area are caused by high tides. The one-percent probability tidal flooding event will result in a maximum water surface elevation of about 1.6m in the area.

3.1.6 Ground and surface water

The waterways within the South Saigon area are polluted by sewage, nutrients and litter from local residences and from HCMC. Attempts have been made by the Vietnamese authorities to reduce the levels of pollution by relocation of residences away from the waterways, cleaning of the floors of the waterways and appropriate sewage disposal.

On the campus site, the water table is less than 0.5 m below ground level. Even during the "dry" (non-monsoon) conditions, water flows through the site and no instances of stagnant (eutrophied) or odorous water bodies were observed on the site during the Meinhardt site assessment. Within the site, current pollution of waterways is most likely to be due to disposal of sewage and other wastes from dwellings.

The tidal range is relatively high but its yearly variation is low. The records at the Phu An Hydrometeorological Station indicate an average range of 1.7 m to 2.5 m, with a maximum value of 3.95 m. Seawater intrusion may be significant during the dry season.

The volume of freshwater flowing down the Saigon River and other major waterways connecting to waterways on the site is so great that waterways surrounding and on the site appears to be freshwater rather than brackish or saline. The volumes of water are also so great that a large dilution factor of pollutants can be expected.

The Ong Lon appears to be less polluted than the Xang Canal, but still appears to be a degraded waterway, particularly where it is entered by the Xang Canal. The Ong Lon is a large waterway and pollution from the Xang Canal is diluted as it enters the Ong Lon River. However, the Ong Lon was observed to be odorous, even at the southernmost point of the campus site on the River. High levels of litter were also observed in the river.

Water samples analysed in the study by Meinhardt in February 1999 indicate that the waterways intersecting and surrounding the site are polluted. Levels of Chemical Oxygen Demand (COD) and Biological Oxygen Demand (BOD) consistently exceeded Vietnamese and the Environment Protection Authority Victoria (EPAV) recommended limits, indicating pollution by nutrients likely to result in eutrophication of waterways. Total nitrogen levels in water samples were consistently higher than recommended EPAV limits, creating risk of algal blooms and subsequent eutrophication of waterways.

Levels of Total Coliform are consistently high and frequently exceed Vietnamese Standards for Pollutants in Surface Water Resources (5942-1995). The source of pollution can be attributed to untreated domestic wastewater (sewage and sullage).

The highest Coliform counts occur on the Xang Canal. The most probable source of this contamination is discharge of effluent from District Eight. The levels of contamination may pose health risks to persons exposed to water for contact recreational purposes. In the event that water from contaminated waterways were used for spray irrigation, the levels of contamination may pose health risks due to suspended droplets of water.

The pH levels were found to be within Vietnamese and Victorian EPA surface water quality limits, indicating that the large volumes of water had buffered any leachate from acidic soils.

During the first week of February 2000, VESDEC carried out additional survey. In that mission samples of 5 sampling points had been taken and analyzed. The results are presented in Table 3.3 in Appendix 6 and confirm the findings of the earlier study conducted in February 1999 (Appendix 4).

3.1.7 Geology

The subsurface conditions at the site appear to comprise up to 15m of very soft organic clay, overlying further soft to firm clays, to about RL -21 m. A band of medium dense sands then extends to about RL –29 m. Underlying this sand are further interbedded clays and sands generally of firm to stiff consistency for the clays, and medium dense for the sands. The available borehole data ends at RL-40 m, still in medium dense to loose sands. The clay soils to RL –21 m are expected to be highly compressible and of low strength.

3.1.8 Air Quality

HCMC does not yet have the significant air pollution problems of many Asian cities. However motor vehicles are increasing and air pollution is rising. Serious localised problems are also becoming apparent as a result of industries such as cement plants, steel mills and fertiliser plants.

On the basis of the data obtained from the VESDC studies in the dry seasons of February 2000, and hourly observation in the area site, air quality in the project area can be assessed as good (refer Table 3.4, Appendix 6). Concentrations of SO_2, NO_2, total hydrocarbon (THC), H_2S are still much lower than that of the maximum allowable levels of the Vietnamese Ambient Air Quality Standards (TCVN 5937-1995).

However, concentration of particulate matter (PM) is higher than ambient air standard (TCVN 5937-1995) due to transport activities.

All the observed data indicate that noise level at site is not too high (60 - 85 dBA at rush hour). However, it exceeds noise requirements in the Vietnamese Standard for sensitive area as resident area (lower than 70 dBA).

3.2 Ecological Resources

3.2.1 Flora

The survey undertaken by VESDEC in February 2000 indicated that there are two dominant ecosystems within the project area. Inland fauna was not identified

Lowlands Influenced by Tide

Along the Tu Dinh Watercourse, Cyperus malaccensis (Lac nuoc) is frequently dominant. In addition, the survey team identified other species such as: Sacciolepis myosuroides (Mom mo), Nypa fruticans (Dua nuoc), Acrostichum aureum (Rang dai). In the higher regions, available shrub vegetation consists: Glochidion littorale (Tram bau), Sonneratia caseolaris (Ban chua), Annona glabra (Binh bat), Cryptocoryne ciliata (Mai dam), Derris trifolia (Coc ken), Acanthus ebracteatus (O ro). Some hygric species are present in the higher wet regions as Eclipta prostrata (Co muc), Panicum repens (Co ong), Mimosa pigra (Trinh nu nhon), Passiflora foetida (Nhan long), and Ipomoea aquatica (Rau muong).

Land along the Roads

Road construction has resulted in recent changes to the composition of soils. The Poaceae (Hoa ban) family is dominant. Eleusine indica (Man trau), Echinochloa stagtina (Gai thao muong), Eragrostis tremula (Xuan thao), Pennisetum polystachyon (Co duoi voi), Chloris barbata (Luc long), Cynodon dactylon (Co chi), Dactyloctenium aegyptiacum (Co chan ga), Hedyotis heyni (Lu dong), Emilia sonchifolia (Chua le), Polanisia chelidonii (Mang mang tim), Mimosa pudica (Trinh nu) were all identified within the area.

In general, the number of plant species in the study area is not abundant (29 species), and includes many common species. The site is covered by fresh water vegetation. A list of inland species identified is included in Table 3.5 in Appendix 3.

3.2.2 Aquatic Organisms

The results of VESDC's survey in February 2000 are presented in detail in Appendix 6 (Tables 3.3 to 3.11). Following is a summary of these results.

The aquatic organisms can be grouped as:

- Zooplankton : 24 species
- Zoobenthos : 13 species
- Phytoplankton: 111 species

Species groups in low brackish water environment are:

- Zooplankton: Oithona similis, Limnoithona sinensis, Mesopodopsis slabberi, Polychaeta larva.

- Zoobenthos: including 7 species of Polychaeta, Tachaea chinensis (Isopoda – Crustacea), Angulus vestalis (Mollusca – Bivalvia).

- Phytoplankton: including 8 species of Coscinodiscus genera, Leptocylindrus danieus, Chaetoceros compactum, Biddulphia levis, Ditylum sol, Gyrosigma balticum.

Species groups in low acid water are:

- Zooplankton: Lecane (Monostyla) bulla, Brachionus quadridentatus (Rotatoria), Paracyclops fimbriatus, Ectocyclops phaleratus (Copepoda).
- Zoobenthos: It is not pronounced. May be Limnodrilus hoffmeisteri, Branchiura sowerbyi (Oligochaeta) have distributed widely in fresh water and indicated for low acid water kind.
- Phytoplankton: Phormidium tenue, Eunotia didyma, Eunotia elegans, Ankistrodesmus falcatus, Closteriopsis longissima, Scenedesmus acuminatus, Scenedesmus javaensis, Closterium gracile, Closterium macilentum.

The typical species composition in rich organic matter and polluted environment is:

- Zooplankton: Philodina roseola, Rotaria neptunia, Rotaria rotaria, Brachionus angularis, Brachionus calyciflorus, Brachionus quadridentatus, Moina dubia, Mesocyclops leuckarti, Oithona similis, Pristina longiseta.

- Zoobenthos: Limnodrilus hoffmeisteri, Branchiura sowerbyi, Bispira polymorpha, Potamilla leptochaeta, Melanoides tuberculatus, Nephthys polybranchia, Namalycastis longicirris, Lycastis indica, Neanthes caudata (Polychaeta).

- Phytoplankton: mainly species of Cyanophyta, Euglenophyta and Bacillariophyta: Melosira granulata, Cyclotella meneghiniana, Coscinodiscus subtilis, Chaetoceros compactum, Synedra ulna.

At the beginning of the dry season, fresh water species dominate in Zooplankton (19/24 species) and migratory species of a marine origindominate in Zoobenthos (9/13 species).

Details of the numbers of aquatic organisms are presented in Table 3.12 Appendix 6. In summary:

- Zooplankton: 2,350 to 18,200 individuals/m^3. In most areas, fresh water species are dominant such as: Philodina roseola, Brachionus urceus, Mesocyclops leuckarti vaø Nauplius larva. Occasionally marine species such as Schmackeria bulbosa and Nauplius larva dominate.
- Zoobenthos: 570 to 9420 indivduals/m^2. Species of Limnodrilus hoffmeisteri, Branchiura sowerbyi dominate in some areas. In other areas, Polychaeta dominate.
- Phytoplankton: 70,250,000 to 177,750.000 cell/m.
- In most areas, the dominant species is Cycltella meneghiniana. Occasionally, Nitzschia longissima var. reserva is dominant. Both have migrated from marine areas and adapted conditions of low saline and contamination in this area.

In general, the diversity index of aquatic organisms in the project area is low. Details are presented in Table 3.13, Appendix 6. In summary:

- Phytoplankton: 0.005 to 0.007.
- Zooplankton: 0.059 to 0.186.
- Zoobenthos: 0.054 to 0.377.

Water pollution has decreased the diversity of aquatic fauna and flora. However, wastewater impact differs between sampling points.

Details of the distribution of aquatic organisms are presented in Table 3.14, Appendix 6. In summary, in the canals within the project area, only Phytoplankton has the same distribution over the site. There is variation in the distribution of Zoobenthos and Zooplankton over the site.

3.3 Human and Economic Development

3.3.1 Human Development

Education and training is an area of identified priority for the Government of Vietnam. As part of the process of reform, modernisation and integration with the international community, Vietnam is keen to access formal training from developed countries such as Australia. However the numbers of private students who can afford to study overseas is low compared with other Asian countries.

Vietnam has a population of 78 million, of whom 18 million live in urban areas. This figure is predicted to grow to 100 million by the year 2010 and 112 million by 2030. Trends suggest that 20% of the population is between the ages of 15 and 24 and that the number of students enrolling in secondary education is about half of the relevant age group population. This ratio is expected to increase with the improvement in Vietnam's economic situation.

Vietnam has almost universal primary school enrollment and has established a comprehensive network of educational institutions throughout the country, including a primary education facility in every commune. In 1995 the adult literacy rate was 91% for women and 96% for men. Compared with other countries with similar income levels, these percentages mark great achievements in education. However access to education is marked by substantial inequities with public spending on education biased towards the non poor.

One of the major challenges for Vietnam is to ensure that the system of education and training responds to the emerging demands of a growing market economy. Expansion and modernisation of the education and training system are important elements of the Government's strategy to sustain rapid economic growth and alleviate poverty. There has been a rapid increase in tertiary or higher education enrolments with an annual average rate of increase of 11.1% between 1985 and 1995. The Government target is for a 65% increase in enrolments between 1994 and 2004. A number of strategies will be required to achieve this, including user fees and private sector development as well as increased public spending. The rate of return to family investments in tertiary education is high and students who attend colleges and universities should be expected to share significantly in the burden of costs of their education. This should help the Government to meet its medium to long term targets and reduce what must be recovered from the State budget. By encouraging private alternatives for families with financial resources, the Government subsidies already going to education will redistribute themselves automatically in favour of poorer families.

The Joint Report of the Government-Donor-NGO Working Group (December 1999), Attacking Poverty, indicates considerable progress in reducing poverty between 1993 and 1998. The report indicates:

- Improvement is represented quantitatively by rising per capita expenditures and improving social indicators including: enrollment in primary and secondary education; child and adult nutrition; access to infrastructure; and ownership of consumer durables.
- Poverty is largely a rural phenomenon with 45% of the rural population living below the poverty line.
- Pockets of severe poverty exist in urban areas.
- The South East region, including HCMC, is the wealthiest region by a considerable margin.

The Joint Report concludes that Vietnam's high economic growth rate from 1993 to 1998 underlies the success in reducing poverty. This growth was based largely on land-based agricultural diversification which may be limited in the future. The report also points out that the rate has fallen to around 4% in the crisis years of 1998 and 1999 and that greater reliance for growth will need to be placed on rural off-farm employment and urban employment.

The development of opportunities for employment and productivity growth are linked to providing Vietnam's workforce with appropriate skills, competencies and qualifications required for an emerging economy. Hanoi and HCMC are the focal points for Vietnam's industrial and commercial activities and the development of new technology based industries. They account for approximately 50% of the nation's GDP (HCMC 35% and Hanoi 15%). Skills in demand in these major centres cover information technology, marketing, logistics, distribution, manufacturing automation, education and education management, business administration, financial management, international trade, property management, human resource management and environmental management.

3.3.2 Current Infrastructure and Development Status

As part of the Feasibility Study undertaken for the project, the consulting engineering firm of Bonacci Winward undertook a study of the current infrastructure and the infrastructure needs of the project. The report on infrastructure is included as Appendix 5.

There has been no construction work to date on land held by the MASD. PMH has undertaken substantial landfilling operations for construction of the Saigon South Parkway, raising ground level from approximately RL 0.5 m to RL 2.35 m, some 850

mm above the maximum high tide recorded (over a 50 year period), of RL 1.50 m.

Landfill is ongoing for the PMH development sites. Sand is dredged from the Saigon River, barged and trucked to site, and placed with minimal (if any) compaction. Various buildings and facilities have already been constructed on PMH land, and others are under construction.

PMH is responsible to supply the infrastructure requirements of the 600 hectares of developable land which they hold. As a private supplier, they may extend their supply of services to other developments within Saigon South, including to those on MASD land.

Electricity Supply

Power is currently available via PMH's Power Station at Hiep Phuoc, approximately 20 km to the south. It supplies the new City Centre area (east end of the Parkway), and is being reticulated (aerially), to other PMH sites. Presently there is no reticulated electricity supply to the site. The nearest available supply exists approximately 2km east on the southern side of Saigon South Parkway at PMH's Substation A2. This substation is supplied by diesel generator sets (size unknown but estimated at 1.5MVA maximum) and transformed to high voltage for reticulation to existing installations at the eastern end of Saigon South Parkway.

Water Supply

Water is currently being reticulated (generally underground), to PMH sites from the secondary treatment plant at Tan Thuan. Water originates from the Government Water Supply at Thu Duc, some 15 km north of HCMC. Water is not available at the RMIT site at present.

Communications

PMH is progressively bringing communication services to Saigon South, but not as far as the RMIT frontage at present. Clarification has been sought from PMH as to the standard of service to be provided.

Sewage Treatment

There is no trunking or treatment plant available at present, though it is part of the long term plan for Saigon South.

Stormwater System

Stormwater presently discharges directly to the canal/river system.

3.3.3 Land Use

Land-use on the site consists of areas of uncultivated marshland and rice cultivation on reclaimed agricultural land on the rest of the site. Several clusters of dwellings exist on the site. In addition to rice cultivation, many of the dwellings have deeper ponds into which sewage and organic household waste are deposited. These ponds are used for the cultivation of fish, ducks, molluscs and water vegetables.

Much of the land facing the Saigon South Parkway consists of marshland that is not used extensively by local farmers. It appears that some uncultivated water vegetables are harvested from the area. Traffic on the site is restricted mainly to pedestrian traffic. In some areas where waterways are sufficiently deep and wide, boat traffic also occurs.

A Compensation Strategy was prepared as part of the Feasibility Study for the Project in August 1999. The Strategy detailed the following land use on the Project site:

- Farming land and ponds: 52.31 ha
- Dwellings: 0.95 ha
- Ditches: 7.31 ha
- Gardens and hill: 2.0 ha.

Housing and Properties

The Compensation Strategy indicates that 134 households will be affected and are subject to resettlement. There are 152 persons residing on the site and 216 unemployed farm labourers.

The compensation for affected people is detailed in:

- The Decision No. 5352/QD-UB-QLDT dated 21 July 1995 by HCMC People's committee regarding the Regulations for compensation to move inhabitants in the area of zone planning of the South Saigon New Urban in districts of 7, 8, Binh Chanh, Nha Be;

- The Decree No. 22/1998/ND-CP dated 22 April 1998 by the Government and Memo No. 22/1998/U-B-KT dated 3 January 1998 by HCMC People's Committee regarding the guidelines for other basic construction expenses.

3.4 Quality of life values

3.4.1 Socio-Economic Values

Education and training is an area of identified priority and high demand from the Government of Vietnam. As part of the process of reform, modernisation and integration with the international community, Vietnam is keen to access formal training from developed countries such as Australia. However the numbers of private students who can afford to study overseas is low compared with other Asian countries.

3.4.2 Gender

There have been some changes in attitudes to women in Vietnam and major achievements in setting up a legal framework to ensure women's rights and equal status in society. However women suffer a range of disadvantages, particularly in rural areas and among ethnic minorities. In general, women's educational attainment is lower than men's and they are poorly represented in decision-making positions in the workforce. The rate of women obtaining tertiary and higher education degrees (1.1%) is half that of men (2.1%).

3.4.3 Archaelogical /Historical Treasures

The site currently contains 97 concrete graves and 688 soft graves. Relocation of these graves forms part of the Resettlement Action Plan.

CHAPTER 4 SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1 General

A matrix summarising impacts from both the construction and operational phases of the Project is included as Table 4.1 which follows.

Table 4.1 Impact Matrix

IMPACT	MITIGATION MEASURES
PROJECT LOCATION	
Resettlement of current occupants and loss of land	Adequate compensation to allow for relocation, purchase of suitable land to allow resumption of agriculture and aquaculture and construction of houses. Counselling and training of people as appropriate.
Relocation of graves	Adequate funds made available to ensure proper transportation and relocation of graves.
Loss of wetlands	Design allows significant areas to be retained. Use of timber walkways.
CONSTRUCTION PHASE	
Earthworks interfering with hydrology	Contractor to construct temporary drainage to ensure drainage of surrounding areas is not disrupted. Contractor to ensure proper disposal of spoil and to minimise changes to the landscape.
Increased traffic	Temporary access roads to be constructed by the Contractor.

Increased dust, gas emissions and vibration	Use of dust control agents eg water. Paving of heavy use areas. Appropriate location of equipment and vehicles away from residential areas. Proper maintenance of vehicles and equipment.
Acidification due to exposure of acid sulphate soils.	Minimisation of disturbance of acid sulphate soils. Burial, neutralisation and separation of the soils.
Risks to safety of workers	Implementation of OH&S Plan. Provision of medical facilities on site.
Increased noise levels	Implementation of Noise Management Plan ensuring noise limitation to daylight hours and installation of noise barriers and mufflers on vehicles as required.
OPERATION	
Increased traffic	Implementation of Transportation Plan including details of the internal traffic system, off street parking, loading and service access.
Inappropriate effluent discharge causing health problems and algal growth in canals.	Treatment plant involving nutrient removal and odour control measures. Additional filtration using sand filters if necessary.
Flooding of the site and surrounding areas.	Stormwater collected and directed to the wetlands via underground pipes or covered channels. Peak runoff reduced by restricted capacity of culverts. Levees will allow some detention of runoff in the canals.
Pollution of waterways and disturbance of hydrology of the area.	Careful design of internal waterways to minimise impacts. Construction of bund and valve controlled outlet to allow drainage of canals for maintenance. Construction of

	culverts to allow twice daily flushing.
Risks of accidents in laboratories, workshops and fuel storage areas.	Implementation of OH&S program including monitoring and maintenance of equipment, general safety procedures including fire fighting and evacuation.
Benefits only to already advantaged groups in Vietnam.	Implementation of student scholarship and loan programs.

The main positive impacts of the RMIT International University Vietnam project will be:

- The provision of access to high quality, international standard tertiary education to Vietnamese within Vietnam;
- Greater access to high quality international standard tertiary education and training through a targeted scholarship and student loan program to educationally disadvantaged groups including women, people from low socio-economic backgrounds, rural areas and ethnic minorities;
- Greater potential for graduates to increase income in later life;
- Employment opportunities during construction and operation of the University for Vietnamese;
- Contribution to skills upgrading through industry training programs, resulting in increased productivity within the Vietnamese economy;
- Enhancement of the tertiary system in Vietnam by assisting with the professional development of personnel from other Vietnamese public universities;
- Promotion of research and innovation linked to local industry which will promote the social and economic development of the region and Vietnam.
- Involvement of the University in a broad range of community services including poverty reduction and environmental protection activities.

4.2 Impacts due to Project Location

4.2.1 General

The campus site was designated as the site of a university in the Saigon South Master Plan which has been approved by the Government of Vietnam. The Saigon South master plan was developed to provide HCMC with the necessary amenities, services and infrastructure to accommodate a projected increase in

metropolitanpopulation to 10 million. This Project is therefore consistent with regional and national planning objectives.

4.2.2 Resettlement

Potentially adverse impacts of the specific location of the campus are mainly in relation to the loss of land and houses. The VESDEC Report (Section 4.2.2) indicates that there will be an annual loss in rice and aquaculture production to a value of approximately $23,000. The need to relocate graves may have a spiritual impact on some of the current residents of the Project area.

Full implementation of the Resettlement Action Plan for this Project will ensure that these potential impacts will be adequately mitigated. The Plan will provide compensation to ensure that the current occupants are given compensation to enable them to purchase suitable land, reestablish agricultural and aquaculture practices and to construct houses of at least the same standard as those which they are currently occupying. The cost of proper transportation of the graves will be included in the compensation and support will be provided to the people who are relocating.

4.2.3 Natural Ecosystems

Development of the campus will involve loss of some wetland area but the project site is not located in the planned biologically protected zone. This Saigon South area has been designated as a development zone to be used for the construction of roads, buildings and parks.

The Cangio Mangrove Forest, which is one of the best mangrove ecological zones in Vietnam, is located about 20 kilometres from the project site to the South. The project activities will not have direct impact on this forest. The design of the campus will enable retention of significant areas of the 62 hectare site as a wetland environment. Natural vegetation will be retained wherever possible. To reduce impact on the wetland areas, a series of connected elevated walkways will be constructed within the campus.

Although the land clearance for campus construction will have a negative impact on the natural ecosystems this is not considered to be serious because the area to be affected is very small.

4.3 Impacts during Construction

4.3.1 Project Earthworks

The exact nature of the earthworks and buildings will be determined during the detailed design stage. However a major land filling operation is required to raise the existing ground level in roadway, building and paved areas from about RL 0.5 m to an average of approximately RL 2.5 m. Sand filling dredged from a range of sources including the Saigon River will be barged and trucked to site. Dredging practices will be in accordance with government regulations and the material will be tested for suitability as landfill prior to transportation to the site.

The Contractor will be required to provide details of measures to:

- prevent any major disruption of surface drainage;
- minimise changes to the landscape;
- ensure proper disposal of construction spoils.

Monitoring of implementation of these measures will ensure that no major disruption of surface drainage occurs.

4.3.2 Impacts on Soil and Water

During construction, pollution of soil and water may occur as a result of:

- oil and grease from construction equipment and asphalt plants;
- erosion at construction sites, fills and waste dumps;
- wastes from construction camps and work sites.

The Contractor will be required to provide details of measures to minimise pollution and this will be monitored throughout construction. These measures will include installation of appropriate sanitation facilities for the construction site.

4.3.3 Road Transport and Traffic

Construction of the campus will generate additional traffic on the South Saigon Parkway and other feeder roads, however this increase will not hamper the normal traffic flow. It is anticipated that during peak construction periods the number of trucks per day will be fifty.

The Contractor will build temporary access roads to the construction site to minimise disruption to the roads in the area. A Traffic Management Plan will be provided by the Contractor to ensure that normal traffic flows are not hampered.

4.3.4 Air Quality

During the construction phase, air quality may be reduced as a result of dust and emission of gases from construction vehicles and equipment. These may include trucks, compactors, pile drivers, jackhammers and drills, generators, asphalt heating equipment, and concrete batch plants. Particularly during the dry season, dust may affect residents of houses close to the site as well as workers on the construction site.

The Contractor will be responsible for monitoring levels of dust and emissions and for implementation of measures to minimise these levels. These will include the use of dust control agents such as water and the paving of roads subject to heavy traffic.

4.3.5 Agriculture

Permanent disruption of agricultural practices will occur in the area to be acquired for the campus. In the direct vicinity of the construction area, agricultural practices may be disrupted as a result of temporary disruption of surface hydrology.

The design of the waterways on the site will ensure that the disruption to surface hydrology will be minimal during construction and will not have a permanent impact on agricultural practices surrounding the site. The Resettlement Action Plan will implement measures to ensure proper relocation of agricultural practices from the site to other suitable areas.

4.3.6 Soils

Acid sulphate soils as occur on the site may cause problems. Exposure of these soils to oxygen, for example by drainage or excavation, can generate sulphuric acid. This may result in acidification of soils, surface water and groundwater. Runoff and leachate from these soils can adversely affect aquatic communities, agriculture and structures including concrete.

Most of the excavated material will be used as base construction material and will be covered by sand, stones or concrete. Leakage into surrounding areas such as rice fields, ponds and rivers is therefore expected to be minimal.

An Acid Sulphate Soil Management Plan will be implemented including descriptions of the soil characteristics and the location of potentially sensitive environmental receptors such as water bodies. The plan will also include a description of the acid

sulphate soil management strategies incorporating the proposed construction schedule and the volume and proposed disposal location of the acid sulphate soil. A monitoring program for soil, surface and groundwater quality; and discussion of contingency measures will be included. The measures adopted for treating sulphate soils will include: minimisation of disturbance of the soils and treatment or management of the acid sulphate soil by burial, neutralisation and separation. Treatment techniques will be based on either reducing the oxygen flux to negligible levels through burial beneath low permeability sediments or increasing the neutralisation capacity of the sediments by the addition of lime. Measures may also include allowing acid sulphate soil to oxidise but managing the leachate by its neutralisation as it runs off. This may be incorporated into landscaping with drains lined with crushed limestone or concrete to neutralise the acid being generated.

Design of the building foundations will take the highly acid nature of the soils into account.

4.3.7 Occupational Health and Safety

Occupational health risks are those related to major construction activities, primarily accidents.

The Contractor will be required to minimise occupational health risks through implementation of an Occupational Health and Safety Plan and provision of appropriate medical facilities on site.

4.3.8 Noise and vibration levels

Construction activities will raise the noise and vibration levels to which the surrounding population is exposed. This will be the result of use of dredging equipment, electricity generation, pile driving and increased vehicle activity.

Table 4.5 in Appendix 6 provides details of Vietnamese permissible noise levels in public and residential areas. The Contractor will be required to meet these standards and to implement a Noise Management Plan. In particular, the plan will ensure that noise is limited to daylight hours when appropriate and that enclosures and barriers are set up if necessary. The fact that construction will occur at a considerable distance from any residential areas means that this will not be a significant problem.

4.3.9 Socio - Economic Impacts

A direct benefit of the Project during the construction phase will be the creation of employment opportunities and generation of income for the surrounding local communities because of the presence of construction workers.

Since the construction workers are expected to be drawn from the HCMC area it is not anticipated that there will be any impacts associated with transmission of diseases or conflict between local people and the workers.

If workers foreign to the area were introduced an appropriate education program would be implemented by the Contractor to ensure minimal conflict.

4.4 Impacts During Operation

4.4.1 Traffic

The activities associated with the campus will result in an increase in traffic within the area. With an anticipated student and staff population of 14,000 by Year 12 of operation there will be an increase in bus, car and bicycle/cyclo traffic.

The Saigon South Master Plan indicates that a major transit corridor (the Saigon South parkway) will be developed through the overall development area, connecting major centres including the RMIT University. It also suggests that the Saigon South transit corridor may be extended to the west and east by crossing the Saigon River to create a loop system around HCMC. This would also provide a link to other transit corridors and destinations. The Saigon South corridor is linked to National Highway 1 and Provincial Road 15. Other transit system lines operating on the existing street network of HCMC may be extended to connect to the Saigon South corridor and beyond.

A transportation plan will be developed for the campus, incorporating the requirements of the Zone Planning decision by the HCMC People's Committee ((2 August 1999) which indicates that the internal roads leading to the Binh Thuan Road and the North South Highway will incorporate a roundabout.

The internal traffic system will consist of:

- A 12 m wide road linked with the Binh Thuan Road and the North-South Highway;
- An 8 m wide road on the bund along the Binh Thuan Road and the Ong Lon Stream;
- A 2 m wide walkway serving all other campus areas.

The master plan for the campus development includes appropriate amounts of off-street parking , loading and service access for the campus.

4.4.2 Effluent Disposal

The Saigon South Master Plan reports that in the initial phase, each development should be required to provide treatment facilities. The Master Plan also requires this decentralised sewage treatment system to be adaptable in the future, to connect to a centralised major treatment system, as the city becomes an important urban centre.

A package treatment plant will cater for the first stage of the development and similar units will be added progressively to suit the future growth of the University. Primary treatment will involve screening. Secondary treatment will involve the oxidation of sewage solids by aeration and then settling out and removal of sludge. Chlorination will also be included as part of the secondary treatment when discharging directly to the canals during the wet season. Tertiary treatment will include filtering and chlorination. The treatment plant will probably be located in a landscaped zone so that it will be screened by suitable vegetation. Odour control may be required, depending on the plant's final location and adjacent land use. Additional filtration through a properly designed sand filter could be added, if the need arises. The plant will comprise separate tanks for screening, aeration and settlement.

The standard adopted by the project for waste water discharge is the Vietnam Standard on "Industrial Waste Water Discharge Standards". This allows waste water to be discharged into water bodies used for sources of domestic water supply if the BOD is less than 20 mg/l and the suspended solids are less than 50 mg/l. The packaged sewage treatment plants to be installed on the campus plants produce effluent with BOD of 10 mg/l and suspended solids of 10-15 mg/l so that effluent would be of much better quality than required by the standard. The standard will be achieved by setting requirements for production of effluent in the Contract Documents, and by requiring tenderers to provide evidence of having installed similar plants producing effluent of the required quality at other sites. With tertiary treatment, the effluent quality can be further improved to BOD of 5 mg/l and suspended solids of 2-3 mg/l. It is proposed to spray irrigate the landscaped and conservation areas of the site with effluent during the dry season. This additional treatment will assist with odour control and will also limit nutrient build up in the canals within the site which could promote algal growth. During the wet season, effluent will be disposed of directly to the internal canals.

Sewage reticulation should be delayed as long as possible, to minimise risks of settlement of filling. Allowance has been made in the estimates for short, relatively steep runs of sewer, with additional bedding support and multiple small pumping points to minimise possible problems associated with long term settlement of filling.

4.4.3 Solid and Hazardous Waste Disposal

The campus facilities may include chemical, biochemical laboratories, mechanical workshops, by-pass generators and fuel storage tanks. Waste water from these units may contain solids, organic matter, bacteria, oils, hydrocarbons, heavy metals and phenols. Discharge of this effluent into soils, canals or ponds may pollute soils, ground water and surface water.

The VESDEC Report (Appendix 6) estimates the daily amount of domestic solid wastes generated from the campus will be 4,000-5,000 kg, containing mainly organic matters, plastic, papers and glass.

The campus will be serviced by the Urban Environment Company which will collect solid waste on a daily basis and transport it to an appropriate landfill site. In accordance with RMIT's Environmental Policy, the recycling and re-use of goods and materials used on the campus will be encouraged. Clean and readily identifiable receptacles for materials to be recycled will be provided. The material will be collected by recycling contractors on a regular basis. Procedures dictating the handling, storage and disposal of hazardous wastes (chemical, radioactive and clinical) will be implemented in accordance with RMIT University's Waste Management Strategy. These procedures will indicate who is responsible, methods and locations of disposal of wastes as well as monitoring to ensure compliance with the procedures. This will ensure that hazardous wastes will be stored separately from other solid wastes, and will be collected by an appropriate contractor in dedicated vehicles and using separate disposal areas. Enclosed refuse collection vehicles will be used as necessary.

4.4.4 Stormwater System

Stormwater will be collected from all building roofs and paved areas and directed to the naturally occurring wetlands and the canal system via underground pipes or covered channels. Suitable scour protection will be provided where drains discharge to the canals. With the building platforms, roads and paths filled to approximately RL 2.5 m and the top water level during a storm at high tide of about RL 1.6 m, the buildings will always be adequately drained and flooding of buildings will not occur.

4.4.5 Waterways

Hydrological issues in relation to the waterways will be addressed during the detailed design. This will include design of bunds and culverts to ensure minimal impacts on agriculture in surrounding areas and on fisheries.

Culverts will flush the canals twice daily with the natural ebb and flow of the tide which occurs twice daily. This twice daily flushing will prevent a build up of nutrients from effluent discharge, which could lead to weed or algae growth if not controlled by flushing. Water will flow into the canals each day as the tide rises but because the outlet culverts from the canal are set at level higher than the low tide level and also higher than the excavated depth of the canals, there will always be some water in the canals.

The maximum recorded high tide level in the streams and river adjacent to the site is 1.5 m. The proposed fill platform for the campus is 2.5 m with building floor levels at least 2.7 m. The river levees have a proposed top level of 2.5 m. The runoff from the campus is designed to discharge entirely into the adjoining rivers and canals. A spillway set at 2.1 m will allow water from behind the levee to flow back to the river and prevent flooding of the site. The provision of levees will allow the canals to provide some detention of stormwater runoff from the site. The runoff will be released to the river through the culverts at a reduced rate because of the restricted capacity of the culverts. This will reduce the peak runoff rate but will not change the total volume of runoff. It will lessen the likelihood of the project contributing to flooding of downstream sites during peak rainfall events.

4.4.6 Noise, Vibration and Air Pollution Levels

The increase in traffic as a result of operation of the University may result in increases to the levels of noise, vibration and air pollution. These levels will be monitored and kept at acceptable levels through implementation of the Environmental Management Plan.

The services infrastructure will not include boilers. The generators used will only operate in periods of electricity failure and will have emission controls fitted in accordance with world's best practice for good commercial quality engines. If necessary to further reduce emissions, catalytic converters can be fitted to the generators. These would reduce emissions of nitrogen oxides, carbon monoxide and hydrocarbons. The air conditioning systems to be installed will not include CFC refrigerants. R22 refrigerant gas will be phased out in 2001 and thus the refrigerant selected will be chosen for optimum ecological sustainability.

4.4.7 Life Safety and Fire Protection

Fuel storage tanks will be designed to meet appropriate technical requirements including location, fire prevention walls, anti-thunder systems automatic smoke and fire warning systems. The site infrastructure includes a reticulated external fire hydrant system with street hydrants located in accordance with the Water Reticulation Code of the Water Services Association of Australia. Within the campus buildings, hose reels, fire sprinklers, fire detectors, smoke detectors, emergency warning systems and emergency/exit lighting will be installed based on Australian codes and regulations.

4.4.8 Socio-Economic Impacts

By comparison with its Asian neighbours, Vietnam has made good progress over the past decade in its system of education and training. Vietnam's plans for expansion of its education system calls for rapid enrolment increases at all levels. However, based on World Bank data, economic rates of return to education and training in Vietnam are low by international standards (approximately 5 per cent per year of education). However, this is consistent with evidence from other centrally planned economies and economies in transition.

The proposed university to be developed by RMIT in Vietnam is expected to generate a wide range of economic and financial benefits or impacts. Due to a paucity of data, it is not possible to quantify in monetary terms all the technical, economic, financial and social implications of the planned investment in tertiary education.

In order to identify the likely range of socio-economic impacts and to estimate the economic and financial viability of the proposed campus investment, a series of detailed economic and financial analyses have been completed. The methodology which has been relied upon follows conventional multi-lateral agency methodology. All costs, benefits and revenues have been estimated in 1999 constant prices. All taxes, subsidies and grants/transfers have been netted from the financial costs to generate economic costs. The time period of analysis has been 13 years to include 10 years of benefits/revenues after initial project commissioning. Throughout the 13-year time horizon, incremental investments are planned, together with annual operating and maintenance (O&M) activities. Salaries have been estimated separately to cover both local and international staff and support personnel together with necessary accommodation costs. A residual or salvage value for the building, as expended over the first 7 years, has been included as a benefit in the final year benefit/revenue stream. This is a conservative estimate.

Table 4.2 provides a detailed summary of the estimated direct financial benefits of the investment by RMIT. The revenues are as defined in the November 1999 Project

Business Plan and as such, are likely to be modified. They may be considered conservative, as more detailed data on fee levels is available. As HCM City's economy grows, it is expected that the range of contract/client program-based revenues will increase. Increased foreign investment in regional industry is likely to stimulate further the demand for contract training programs. The proposed project's financial internal rate of return (FIRR) is estimated at 7.58 per cent. This is to be considered a conservative estimate, given the likely future growth in both fee-based revenue and contract programs. Additional sources of revenue to be captured by the project's sponsors can be expected to result in a pre-tax FIRR of at least 10 per cent.

Table 4.3 summarises the range of direct quantifiable economic benefits which can be expected to be generated by the investment. These benefits, as distinct from revenues to be retained by the Project's sponsors, will be local, regional and national socio-economic gains. Following the attainment of tertiary training, incremental returns on the cost of attendance can be expected. These will result in increased annual personal/household income and resultant increased incremental monthly expenditures on food, rent, transport, entertainment, clothing, education of younger members, health and household items.

Data from the market research undertaken during the Feasibility Study indicates that families are willing to pay incrementally higher fees for attendance of children at the proposed campus. Family incomes include 4 out of the 5 top quintile income ranges, thus indicating the appeal of the campus to middle and lower income families. The average willingness-to-pay (WTP) for fees is approximately $6,500, about 80 per cent higher than at existing tertiary institutions. The average WTP estimate is thus assumed to be the minimum perceived annual benefit of the tertiary study year. Rather than travel abroad to study, Vietnamese students will have the opportunity to attend a 'foreign campus' within Vietnam. This will result in significant foreign exchange savings associated with air travel, accommodation and living costs and academic fees for offshore campuses. Similarly, the proposed RMIT facility is expected to attract a significant volume of Asian students, some of whom may target Australian campuses in the do-nothing or without project situation.

Important non-quantifiable benefits from the proposed RMIT investment have been recognised as likely to be generated. These include:

- Positive economic and social effects within HCMC, the region and throughout Vietnam: These effects will be the result of increasing skill levels within the work force, the transfer of technology, the procurement of goods and services, the creation of job opportunities, and the retention of skilled staff and students in Vietnam.

- Positive effects on the role of women: This will be through the affirmative engagement of women as staff and students.

- Assistance with poverty alleviation: The development of scholarship programs and student loan schemes through agencies such as the World Bank, Asian Development Bank and AusAID and through private donors will be sought in order provide opportunities for higher education to those from poorer families.

- Encouragement of higher education and training at all levels of Vietnamese society.

- Stimulation of development of other tertiary institutions in Vietnam: The University will also offer Vietnam a model to assist Vietnamese educational institutions to develop appropriate flexibility in terms of course content, duration and methods of delivery. An active program of assisting the development of institutional capacity in counterpart universities will be undertaken with present university partners and others.

- Stimulation of research and development and encouragement of foreign investment for research and development support. The campus development plan envisages the creation of R&D Institutes linked to industry and located alongside academic schools. Early indications are that these institutes will cover information technology, environmental studies, biotechnology and food, business management and finance, product innovation and manufacturing design.

- Encouragement of the production and sale of textbooks, resource materials and equipment.

- The provision of ancillary services for students, staff and clients: These will include: staff and student housing; retail outlets for the sale of educational facilities such as books and computers; food outlets; a health clinic; and other retail, recreational, residential and sporting activities operating as part of the campus to meet the requirements of students, staff and other clients.

- Employment opportunities which will be created during the construction phase and the operation of the University: By Year 12 of operation it is anticipated that 288 non academic staff and 390 academic staff will be employed directly by the University and that by Year 6 of operation remuneration to Vietnamese staff will be over US$3.8 million. In addition, employment will be created by the range of commercial activities.

- Provision of student support and employment services as part of the campus development.

- Encouragement of the well-trained members of the Vietnamese community to remain in Vietnam rather than taking up opportunities overseas.

- A strengthening of bonds of friendship and understanding between Vietnamese and Australian individuals, communities and organisations.

Further research will enable the part quantification of a number of these unquantifiable or secondary effects of the proposed investment.

The overall economic rate of return (EIRR) for the project as a whole is estimated at 35.38 per cent. This is to be recognised as a conservative socio-economic impact assessment, given the range of non-quantifiable benefits to be anticipated.

A range of sensitivity tests were undertaken to examine the robustness of the project, under a range of alternative financial and economic scenarios. These results are presented in Table 4.4. The results of the FIRR sensitivity tests indicate that the proposed project is particularly sensitive to reductions in revenues. The results of the EIRR sensitivity tests suggest that the project's socio-economic impacts are significant under the most adverse operating conditions. In summary, the proposed Project is evaluated as both financially and economically viable.

4.5 Potential Environmental Enhancement Measures

As indicated in the previous section, the skills of the population will be significantly enhanced by the University. This will be through the provision of undergraduate courses; postgraduate programs by course work and research; Industry training, in-service and on campus; industry innovation and research and development; English learning and Vietnamese language courses; preparatory and bridging programs; and Study abroad (inbound and outbound) and transfer.

Effective staff development will be essential for the maintenance of appropriate standards for the RMIT International University Vietnam. The University will allocate a reasonable percentage of its annual operating budget for staff development. Local and foreign staff in both academic and administrative areas will be encouraged to attend courses, conferences and seminars in Vietnam and overseas to enable upgrading of professional knowledge and skills.

4.6 Public Involvement

The Project has been conceived in close consultation with the Government of Vietnam and the HCMC People's Committee to ensure that it is consistent with the development objectives of Vietnam, HCMC and its surrounding region. Local industry has also been consulted to gauge the level of support for such a project. Feedback has been positive. RMIT's market research study included structured interviews of potential students, parents and school teachers. The Project has received significant media coverage presenting a positive view in terms of the social and economic benefits of the proposed international university.

CHAPTER 5 INSTITUTIONAL REQUIREMENTS AND MONITORING PROGRAM

5.1 General

Environmental Management Plans require mitigation, monitoring and institutional measures to be taken during implementation and operation to eliminate adverse environmental and social impacts, offset or reduce them to acceptable levels (World Bank's Operational Policies OP.4.01, January, 1999).

The Board of Management of the University will be responsible for all aspects of construction and operation of the campus. This will include responsibility for implementation of the monitoring program in relation to impacts on physical resources, human and economic development and quality of life values. The Board will establish an environmental management unit to supervise and monitor the implementation of the proposed mitigation measures during the construction and operation phases. The unit will include an environmental engineer who will conduct day-to-day supervision and monitoring of the program.

Environmental monitoring will be implemented to ensure that the positive impacts of the Project will be enhanced and the negative impacts minimised throughout the construction phases and the during the operation of the University.

The Contractor undertaking construction of the campus will be required to submit an Environmental Impact Management Plan with the tender. Adherence to the Plan will be closely monitored throughout construction.

The Plan will include:

- Appropriate location of the construction camp and concrete batching plants;
- A Traffic Management Plan;
- A Noise Management Plan;
- Temporary drainage works to prevent disruption to the hydrology of surrounding areas and minimise erosion;
- Educational programs for workers as appropriate;
- Methods of waste disposal and sanitation systems for workers;
- Measures to limit water turbidity during dredging activity;
- Details of sources of fill outside the site;
- Measures to limit water turbidity during dredging activity.

5.2 Mitigation of Impacts on Air Quality

During Construction

- Vehicles and construction equipment will be checked for operational noise levels, vibration and gas emissions to meet the Vietnamese Standards (TCVN-1995). Mufflers will be installed and maintained as necessary to meet these standards.

- There will be periodic watering of construction sites and paving of access areas to ensure dust control.

- All vehicles transporting construction materials will cover the vehicle body to prevent dust dispersion.

- Concrete batching plants and asphalt plants will be located over 200 m from residential sites. Effective emission control equipment will be installed and maintained if gas emission from the asphalt plants exceeds the Vietnam Standard for Air Emission (TCVN-5939-1995).

- Emissions from construction equipment and concrete plants will be monitored to ensure compliance with Vietnamese environmental standards.

During the operational phase

- Vehicles will be required to adhere to engine maintenance schedules and standards to reduce air pollution.

- Trees will be planted along the campus boundary of the Saigon South Highway to reduce air and noise air pollution.

5.3 Mitigation of Noise and Vibration Impacts

The Contractor will submit a Noise Management Plan prior to construction commencement. This will include:

- Placement of equipment and vehicles generating high levels of noise and vibration away from residential areas.
- Construction of noise barriers as necessary.
- Limitation of hours of operation of noisy equipment and vehicles;
- Proper maintenance of access road.

5.4 Control of Soil and Water Acidification

Acid sulphate soil management will require monitoring of the sediments and the leachate generated. A monitoring program will be developed including: parameters to be monitored; medium to be monitored; monitoring locations on site and frequency; analyses to be conducted; laboratory conducting the analyses; procedures to be undertaken if monitoring indicates that thresholds are being exceeded: and reporting procedures to relevant authorities.

Surface, ground and leachate water associated with any disturbance of acid sulphate soils will require monitoring for parameters including aluminium, iron, salinity or total dissolved solids (TDS), sulphates, chlorides and pH. In shallow groundwater areas, hydrogeological factors including freshwater inflows, tidal water levels and water table fluctuations would be monitored to ensure development is not affecting maintenance of an adequate water cover over acid sulphate soil horizons. Any soils stockpiled on site will be monitored to assess the ongoing status of any oxidation occurring within the soils. Regular testing for pH is required to assess if the sediments are generating acid. During and immediately after the disturbance of acid sulphate soil, pH of the sediment may need to be monitored daily or more frequently.

The following measures will be implemented by the Contractor to control acidification of water and soil:

- Analysis of the soil to determine acid levels;
- Minimisation of disturbance of acidic soils;
- Covering of acidic soils with other materials such as sand and clay;
- Construction of channels to drain acidic water from borrow pits.

5.5 Occupational Health and Safety Measures

The Contractor will be responsible for development and implementation of an occupational health and safety program for construction workers and for provision of medical facilities on the site.

When the University is operational, the Environmental Management Plan will set criteria for air, noise and lighting to meet the requirements of the Vietnamese standards. The Plan will include details of responsibilities for monitoring, and ensuring adherence to the standards.

5.6 Laboratory and Workshop Safety

A program of monitoring and maintenance of all laboratory and workshop equipment will be developed and implemented.

Fire fighting equipment as appropriate will be installed.

Procedures for working in laboratories and workshops will be documented and compliance monitored.

5.7 Fuel Storage Safety

Fuel storage tanks will be designed to meet appropriate technical requirements including location, fire prevention walls, anti-thunder systems automatic smoke and fire warning systems.

Procedures in relation to fire fighting will be developed and documented. Personnel will be trained in use of the equipment and evacuation procedures. Fire fighting equipment will be readily available and maintained appropriately.

5.8 Legal Requirements

Environmental monitoring requirements in Vietnam are provided in the following:

- The Environmental Protection Law of Vietnam, issued on 10th January 1994 by the Order the President.

- Decree N175/CP on 18th October 1994 issued by the Government, guiding implementation of the Environmental Protection Law.

- Circular N276-TT/Mtg on 6th March 1997 issued MOSTE guiding implementation of pollution control and environmental monitoring.

5.9 Monitoring Programs

A range of programs will be developed and implemented to monitor environmental impact in terms of resettlement and the natural environment. Specific details of programs in relation to air quality, water and sediment quality and noise and vibration follow.

Air Quality Monitoring

Monitoring equipment and methods for air sampling, storage analysis and reporting are regulated by the Vietnam's National Environmental Monitoring System (NEMS). These will be applied with the Vietnam Ambient Air Quality Standard (TCVN 5937-1995) for residential areas and the Exhaust Emission from Vehicles Standard(TCVN 5948-1995). Monitoring will be undertaken during both construction and operational phases.

During the operational phase, it is intended that Environmental Engineering students will monitor air quality as part of their course work. Parameters for monitoring of ambient air quality will include temperature, humidity, wind velocity, dust sulphur dioxide, nitrogen dioxide, carbon monoxide and lead. Parameters for motor vehicle emissions will include carbon dioxide, nitrous oxide, hydrocarbons, lead, benzene, particulates and carbon monoxide.

Monitoring sites before construction commences will be located at approximately five sites on the site and in surrounding areas. During construction, the sites will be located in areas of maximum activity. When the campus is operating the sites will be located within the campus grounds and in surrounding areas.

Monitoring frequency is expected to be twice during preconstruction, monthly during construction and at least twice per year in the first three years of operation.

Water and Sediment Quality Monitoring

Water and sediment quality monitoring will be implemented using standard monitoring equipment and methods for water and sediment sampling, storage, analysis as regulated by the Vietnam National Environmental Monitoring System. The Vietnamese regulations (TCVN 5942 and TCVN 5944) set maximum allowable concentrations of pollutants in surface water (29 substances) and ground water (22 substances).

Parameters to be monitored will include pH, suspended sediments, turbidity, colour, biological oxygen demand, grease and oil and Total coliform.

Noise and Vibration Monitoring

Noise and vibration monitoring will follow the NEMSS guidelines. The Vietnam noise and vibration standard for residential areas (TCVN 5949-1995) and for vehicles (TCVN 5948-1995) will be applied to evaluate noise and vibration levels caused by construction equipment and vehicle operation.

During the construction stage, noise and vibration will be monitored at the nearest boundary of populated areas and sensitive receptors located near by construction sites. During the operation stage noise and vibration will be monitored in the campus. Location of noise and vibration sites will be at the same air pollution monitoring sites.

In the construction stage, monitoring will be undertaken at the peak hours of construction activity. In the operation stage, monitoring will occur once or twice per year and will last 24 hours to obtain hourly reading on vibration and noise.

Resettlement Monitoring

Resettlement Monitoring Programs will be designed and monitored in accordance with the Resettlement Plan. The main indicators that will be monitored regularly are:

- Payment of compensation to Project Affected Persons (PAPs) in various categories, according to the compensation policy described in the Resettlement Action Plan (RAP);
- Public information dissemination and consultation procedures;
- Adherence to grievance procedures;
- Resettlement site location, design, site construction and plot allocation;
- House construction, technical assistance, payment of subsistence and shifting allowances as described in the RAP;
- Employment generation through project implementation and priority of PAP for the options offered;
- Provision of training and credit availability;
- Co-ordination and completion of resettlement activities and commencement of civil works.

An independent monitoring agency will also evaluate resettlement using the following indicators:

- Payment of compensation;
- Coordination of resettlement activities with construction schedule;
- Public consultation and awareness of compensation policy;
- Construction of dwellings;
- Restoration of economic activities;
- Provision of training;
- Level of satisfaction;
- Standards of living.

5.10 Monitoring of other Socio-Economic Impacts

Since the move from a centrally planned economy to a market economy is very recent, there are few private schools and universities in Vietnam. Therefore there is little evidence of the long term impact of a project such as this University. RMIT will implement research studies to monitor its socio-economic impact. This program will include graduate tracer studies; and monitoring of:

- levels of employment of Vietnamese staff;
- equity and access policies;
- scholarship programs.

5.11 Indicative Costs of Environmental Monitoring

- ***Natural environmental monitoring***

During the pre-construction stage:

Air quality noise and vibration	USD 3,000
Water quality monitoring	USD 2,000
	USD 5,000

During the construction stage:

Air quality, noise and vibration monitoring	USD 3,000
Water quality monitoring:	USD 2,000
	USD 5,000

During the operation stage:

Air quality, noise and vibration monitoring	USD 6,000
Water quality monitoring:	USD 2,000
	USD 8,000
Sub-total (3 stages):	USD 18,000

- ***Resettlement monitoring:*** USD 10,000

Total cost of monitoring programs: USD 28,000

CHAPTER 6 FINDINGS AND RECOMMENDATIONS

The Project's most significant impact will result from the resettlement of the households currently occupying the site. The Resettlement Action Plan prepared for the Project will be fully implemented and will adequately compensate and resettle those people.

The campus site was designated as the site of a university in the Saigon South Master Plan which has been approved by the Government of Vietnam. The master plan was developed to provide HCMC with the necessary amenities, services and infrastructure to accommodate a projected increase in population to 10 million. This Project is therefore consistent with regional and national planning objectives.

Any negative impacts are expected to occur during construction are no more severe than what would be expected from any construction project. The Contractor will be required to present for approval by RMIT and the Vietnamese authorities an Environmental Management Plan for implementation during the construction period.

A major land filling operation will be required, which may have the potential to interfere with surface hydrology. The Contractor will be required to undertake the works to ensure minimal disruption during construction and that there will be no permanent impact on agricultural practices on the areas surrounding the site.

Additional traffic will be generated during construction. Contractors will make their own temporary access roads to the construction site. The South Saigon Parkway and the other feeder roads are adequate to handle this increased traffic without significant disruption to the normal traffic flow.

Dust and vibration will be created by vehicles and equipment during the construction phase. Measures to reduce dust and vibration will be the responsibility of the Contractor. These will include the use of dust control agents such as water and the paving of roads subject to heavy traffic.

The exposure of the acid sulphate soils on the site during construction may result in acidification of soils, surface water and ground water. Measures will be introduced to minimise this impact. These will include and minimisation of disturbance in areas where these soils occur and treatment of the acid sulphate soil by burial, neutralisation and separation

Construction activities will raise noise and vibration levels. Management of these levels will be part of the Environmental Management Plan, ensuring that noise is limited to daylight hours, barriers are constructed and construction activities are located away from residential areas as far as possible.

An Environmental Management Plan will be developed and implemented in relation to activities associated with the operation of the University. This plan will include:

- details of monitoring of impacts on physical resources, human and economic development and quality of life values;
- details of measures to mitigate any anticipated negative impacts.

The campus operation will result in increased traffic. The South Saigon Parkway, National Highway 1 and Provincial Road 15 will provide adequate links with HCMC and surrounding areas. A transportation plan will be developed for the campus to link the internal road system with these major transit corridors.

The proposed campus development will incorporate a sewage treatment plant, with treated effluent being recycled for irrigation or discharged into the canal system. Stormwater will be discharged to the naturally occurring wetlands and the canal system. Hydrological issues in relation to the waterways will be addressed during the detailed design. Culverts will be laid to ensure twice daily flushing of the canals.

There are significant long term benefits of the Project in terms of human resource development, employment and economic growth in Vietnam. This will be achieved through an increase in skill levels, the creation of job opportunities during construction and operation of the campus, and the stimulus to economic activity. These benefits will be local, regional and national. They will result in increased personal/household income and therefore in increased expenditure on food, rent, transport, entertainment, clothing, education and health.

Higher education and training in Vietnam will be strengthened. The University will provide a valuable model to assist Vietnamese institutions to develop appropriate flexibility in terms of curriculum, technology and methods of delivery.

CHAPTER 7 CONCLUSIONS

The Project represents a valuable step in the development of tertiary education in Vietnam. It will enhance the country's sustainable economic and social development and contribute to the growth of the region.

There are no significant environmental impacts associated with the campus construction and operation. The development of appropriate Environmental Management Plans during the construction and operational phases should ensure monitoring and the implementation of appropriate mitigation measures as required.