ATTRIBUTE ANALYSIS OF GROUND-PENETRATING RADAR DATA FOR VISUALIZATION OF SUBSURFACE ARCHAEOLOGICAL STRUCTURES

WISARAT KHWANMUANG

MASTER OF SCIENCE
IN APPLIED GEOPHYSICS

Copyright by Chiang Mai University
THE GRADUATE SCHOOL
CHIANG MAI UNIVERSITY
JUNE 2012

ATTRIBUTE ANALYSIS OF GROUND-PENETRATING RADAR DATA FOR VISUALIZATION OF SUBSURFACE ARCHAEOLOGICAL STRUCTURES

WISARAT KHWANMUANG

A THESIS SUBMITTED TO THE GRADUATE SCHOOL IN
PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
MASTER OF SCIENCE
IN APPLIED GEOPHYSICS

Copyright by Chiang Mai University
THE GRADUATE SCHOOL
CHIANG MAI UNIVERSITY
JUNE 2012

ATTRIBUTE ANALYSIS OF GROUND-PENETRATING RADAR DATA FOR VISUALIZATION OF SUBSURFACE ARCHAEOLOGICAL STRUCTURES

WISARAT KHWANMUANG

THIS THESIS HAS BEEN APPROVED

TO BE A PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF MASTER OF SCIENCE

IN APPLIED GEOPHYSICS

EXAMINING COMMITTEE

Assoc. Prof. Dr. Pisanu Wongpornchai

THESIS ADVISOR

Dr. Suwimon Udphuay

Dr. Suwimon Udphuay . MEMBER

Syand Caseyor MEMBE

opyright[©] by Chiang Mai University II rights reserved

4 June 2012 © Copyright by Chiang Mai University

ACKNOWLEDGEMENTS

I wish to express my deepest gratitude to my advisor Dr. Suwimon Udphuay for her valuable time of discussion and suggestion for my thesis.

I also would like to express many grateful thanks to all instructors and staff of the Department of Geological Sciences and the Department of Physics and Materials Science, Chiang Mai University for providing knowledge of Geophysics.

I am very grateful to the Geoscientists Without Borders (GWB) program 2010 and 2011 and the Department of Mineral Resources (DMR) for ground-penetrating radar data from Wat Pan Sao and Wiang Kum Kam archaeological sites used in this study.

I appreciate with sincere thanks to the Fine Arts Department, Chiang Mai branch office for giving information about excavations at Wat Pan Sao.

Special thanks are extended to software developers who originated OpendTect, the free software used for the attribute analysis.

I am grateful to than k Mr. Wuttipong Nubanjong for helping correct my thesis writing and work suggestion.

Finally, I am most thankful to my parents for encouraging and supporting through this study.