


อุทกธรณีวิทยาชั้นน้ำนํ้านครหลวงในเขตกรุงเทพมหานครและปริมณฑล



นางสาว อุดมพร ช่วงฉ่ำ

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จุฬาลงกรณ์มหาวิทยาลัย

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิทยาศาสตรมหาบัณฑิต

สาขาวิชาธรณีวิทยา ภาควิชาธรณีวิทยา

คณะวิทยาศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

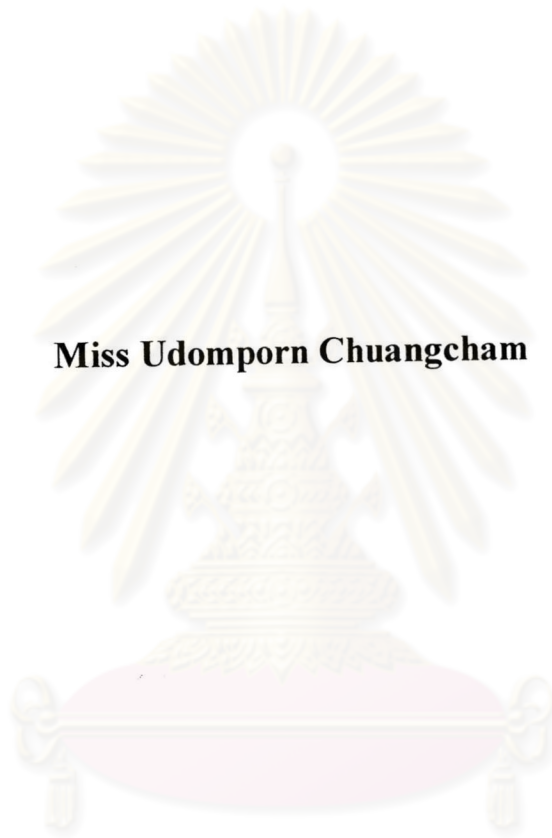
ปีการศึกษา 2544

ISBN 974-17-0386-4

ลิขสิทธิ์ของจุฬาลงกรณ์มหาวิทยาลัย

**HYDROGEOLOGY OF THE NAKHON LUANG AQUIFER
IN BANGKOK METROPOLITAN AREA AND ITS VICINITY**

Miss Udomporn Chuangcham



ศูนย์วิทยทรัพยากร

**A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Science in Geology**

**Department of Geology
Faculty of Science
Chulalongkorn University
Academic Year 2001
ISBN 974-17-0386-4**

Thesis Title Hydrogeology of the Nakhon Luang Aquifer
in Bangkok Metropolitan Area and its vicinity
By Miss Udomporn Chuangcham
Field of Study Geology
Thesis Advisor Assistant Professor Pongsak Phongprayoon
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อุทกพร ช่วงน้ำ : อุทกธรณีวิทยาชั้นน้ำนครหลวงในเขตกรุงเทพมหานครและปริมณฑล.
(HYDROGEOLOGY OF THE NAKHON LUANG AQUIFER IN BANKOK
METROPOLITAN AREA AND ITS VICINITY) อ. ที่ปรึกษา : ผศ.ปองศักดิ์ พงษ์ประยูร,
อ.ที่ปรึกษาร่วม : นางสาวสมคิด บัวเพ็ง, 320 หน้า. ISBN 974-17-0386-4.

การศึกษาอุทกธรณีวิทยาของชั้นน้ำนครหลวงในเขตกรุงเทพมหานครและปริมณฑล โดยอาศัยข้อมูล
เศษหิน ธรณีฟิสิกส์ คุณสมบัติทางศาสตร์ของชั้นน้ำ และ คุณภาพน้ำบาดาล เพื่ออธิบายคุณลักษณะ
เฉพาะของชั้นน้ำนครหลวง

ผลการศึกษาพบว่า ชั้นน้ำนครหลวงอยู่ลึกจากระดับชั้นดิน 125-180 เมตร มีดินเหนียวเนื้อแน่น หนา
2-15 เมตร กั้นอยู่ระหว่างชั้นน้ำทั้งด้านบนและด้านล่าง ชั้นน้ำหนาประมาณ 15-75 เมตร ประกอบด้วยกรวด
ทราย และดินเหนียวแทรกสลับอยู่ ความหนาของชั้นน้ำเพิ่มขึ้นทางด้านตะวันตกบางลงทางด้านตะวันออก และ
เพิ่มขึ้นทางด้านเหนือบางลงทางด้านใต้ของพื้นที่ศึกษา ตะกอนเหล่านี้เกิดจากการสะสมตัวของตะกอนน้ำพาและ
ตะกอนดินดอนสามเหลี่ยมปากแม่น้ำ ลักษณะปรากฏทางเคมีของน้ำบาดาลชั้นนครหลวง แบ่งออกได้เป็นสอง
ชนิด คือ Na-K-Cl-SO_4 และ $\text{Na-K-HCO}_3\text{-CO}_3$ ลักษณะปรากฏทางเคมีชนิดที่หนึ่งพบบริเวณด้านใต้และ
ตะวันตกเฉียงใต้ค่อนข้างตอนกลางของพื้นที่ ส่วนชนิดที่สองพบบริเวณด้านตะวันออกค่อนข้างตอนเหนือของ
พื้นที่ คุณสมบัติทางศาสตร์ของชั้นน้ำ พบว่า ค่าสัมประสิทธิ์ในการซึมผ่าน (Transmissivity) มีค่า 40-2,200
ตารางเมตรต่อวัน และมีค่าสัมประสิทธิ์การซึมได้ (Hydraulic Conductivity) ประมาณ 3-196 เมตร ต่อวัน และ
ค่าความสามารถในการจ่ายน้ำ (Specific capacity) มีค่า 0.3-40 ลูกบาศก์เมตรต่อชั่วโมงต่อระดับน้ำลดหนึ่ง
เมตร และปริมาณการไหลน้ำบาดาลที่คำนวณได้จากตาข่ายการไหล (Flow Nets) ปริมาณสูงสุด 1,295,000 ลูก
บาศก์เมตรต่อวัน หรือ ประมาณ 57 % ของปริมาณการใช้น้ำบาดาลทั้งหมดของพื้นที่ และมีปริมาณการไหลของ
น้ำบาดาลที่คำนวณได้จากตาข่ายการไหลต่ำสุด คือ 435,000 ลูกบาศก์เมตรต่อวัน จากคุณสมบัติทางศาสตร์
ของชั้นน้ำพบว่าชั้นน้ำนครหลวงเป็นชั้นน้ำบาดาลที่มีศักยภาพในเชิงคุณภาพและปริมาณ แต่จากการสูบน้ำ
บาดาลจากชั้นนครหลวงมากเกินไปปริมาณเพิ่มเติมตามธรรมชาติติดต่อกันเป็นระยะเวลาอันยาวนาน จึงทำให้ระดับน้ำ
บาดาลลดลงอย่างรวดเร็ว ก่อให้เกิดผลกระทบคือ การรุกรานของน้ำเค็มและแผ่นดินทรุด สร้างความเสียหายให้
กับเศรษฐกิจและสังคมเป็นบริเวณกว้าง กรมทรัพยากรธรณีจึงได้มีการจัดการทรัพยากรน้ำบาดาลในพื้นที่เพื่อ
ป้องกันและแก้ไขวิกฤตการณ์น้ำบาดาลและแผ่นดินทรุดที่เกิดขึ้น

ภาควิชา.....ธรณีวิทยา..... ลายมือชื่อนิสิต.....
สาขาวิชา.....ธรณีวิทยา..... ลายมือชื่ออาจารย์ที่ปรึกษา.....
ปีการศึกษา.....2544..... ลายมือชื่ออาจารย์ที่ปรึกษาร่วม.....

4172546423 : MAJOR GEOLOGY

KEY WORD: HYDROGEOLOGY / NAKHON LUANG AQUIFER / BANGKOK METROPOLITAN AREA AND ITS VICINITY

UDOMPORN CHUANGCHAM : HYDROGEOLOGY OF THE NAKHON LUANG AQUIFER IN BANGKOK METROPOLITAN AREA AND ITS VICINITY THESIS
ADVISOR : ASST. PROF. PONGSAK PHONGPRAYOON, THESIS COADVISOR :
MISS SOMKID BUAPENG, 320 pp. ISBN 974-17-0386-4.

This hydrogeological study is concentrated in the Nakhon Luang aquifer, one of the Bangkok aquifers systems. The study area is situated in the southern part of the Lower Central Plain. The area displays as the depression filled with unconsolidated and semi-consolidated sediment ranging in age from Tertiary to Quaternary. Cuttings, lithologic logs, E-logs, water quality and hydraulic properties data of the water wells depict that the depth of the aquifer is at 125-180 m. from ground surface. The aquifer shows the deposition under fluvial – deltaic environment. The aquifer consists of the alternative layers of sand, gravel and clay with thickness ranging from 2-15 meters capped on the top and bottom of the aquifer. Thickness of aquifer ranges from about 15-75 meters and shows thickening westwards and northwards. The hydrochemical facies are Na-K-Cl-SO₄ type and Na-K-HCO₃-CO₃ type that occur in the south, southwest up to the central north along the Chao Phraya River and the middle east further to the northeastern part of the study area respectively. Hydraulic properties including hydraulic conductivity, transmissivity and specific capacity are computed from the pumping test data. As a result, they range from 3-196 m/day, from 40-2,200 m²/day and from 0.3-40 m³/hr/m respectively. The hydraulic properties indicate that the Nakhon Luang aquifer is the high potential both in quantity and quality aquifer. The maximum production groundwater yield, from flow net analysis is approximately 1,295,000 m³/day or 57% comparison to the total groundwater extracted while the minimum production of groundwater yield is 435,000 m³/day covering the area 8,000 square kilometers. The heavily pumpage from this aquifer impacts directly to the environment, causing major groundwater problem, especially the rapidly lowering of potentiometric surface, salt water encroachment and also subsidence of the land. The Department of Mineral Resources by its Ground Water Division has conducted groundwater management in Bangkok Metropolitan area and its vicinity.

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Academic year.....2001..... Co-advisor's signature..... *Somkid Buapeng*.....

ACKNOWLEDGEMENT

The author is indebted to a number of individuals and organization for their constant support and encouragement toward the successful completion of this study.

The author wishes to express the deepest gratitude to Assistant Professor Pongsak Phongprayoon, her advisor, for his suggestions and valuable guidance and warm encouragement throughout the study; Miss Somkid Buapeng, co-advisor, for her time and willingness and her valuable suggestions.

Profound thanks are expressed to Groundwater Division, Department of the Mineral Resources for the supply of basic data and information toward the research work.

Thanks are extended to the Krungthep Engineering Consultant Company for providing time, facility and moral supports.

Sincere thanks are due to Mrs. Oranuj Lorphensri, for her help guidance, consultation and suggestion.

Specially thanks Mr. Nattaphon Klaewklang, who helpfully advised the computer programming that used in this study, for his wonderful help is memorable. Additionally, without mentioning their name, the author's gratitude is truly expressed to all those who generously provide supports for this thesis until it's complete.

Most sincere thanks are extended to her family for their valuable loves, supporting, understanding and encouragement.

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