Cairo University

DEVELOPMENT OF AN ANALYTICAL MODEL TO PREDICT OIL RESERVOIRS PERFORMANCE USING MECHANICAL WAVES PROPAGATION

By

Hesham Ahmed Abo Zaid Mohamed

A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfillment of the
Requirements for the Degree of
MASTER OF SCIENCE
in
Petroleum Engineering

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Under the Supervision of

Prof. Dr. Ahmed Hamdi El-Banbi

……………………………….

Professor
Petroleum Engineering Department
Faculty of Engineering, Cairo University

Prof. Dr. Mahmoud Abu El Ela

……………………………….

Professor
Petroleum Engineering Department
Faculty of Engineering, Cairo University

Dr. Sherif Adel Akl

……………………………………

Associate Professor
Geotechnical Engineering Department
Faculty of Engineering, Cairo University

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Approved by the
Examining Committee

____
Prof. Dr. Ahmed Hamdi El-Banbi, Thesis Main Advisor

____
Prof. Dr. Mahmoud Abu El Ela, Advisor

____
Dr. Sherif Adel Akl, Advisor

____
Prof. Dr. El Sayed Ahmed El Tayeb, Internal Examiner

____
Eng. Khaled El Sayed Mowafi, External Examiner
Chairman of Khalda petroleum company.

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
GIZA, EGYPT
2020

Engineer's Name: Hesham Ahmed Abo Zaid Mohamed
Date of Birth: 30/09/1991
Nationality: Egyptian
E-mail: H.A.AboZaid@hotmail.com
Phone: +002-0100 199 1384
Address: El gawadia, Bliqas,
Dakahlia, Egypt.
Registration Date: 01/10/2013
Awarding Date: / /2020
Degree: Master of Science
Department: Petroleum Engineering

Supervisors:

Prof. Dr. Ahmed Hamdi El-Banbi
Prof. Dr. Mahmoud Abu El-Ela
Dr. Sherif Adel Akl

Examiners:

Eng. Khaled El Sayed Mowafi (External examiner)
- Chairman of Khalda petroleum company.

Prof. Dr. El Sayed Ahmed El Tayeb (Internal examiner)
Prof. Dr. Ahmed Hamdi El-Banbi (Thesis main advisor)
Prof. Dr. Mahmoud Abu El Ela (Advisor)
Dr. Sherif Adel Akl, Advisor (Advisor)

Title of Thesis:

Development of An Analytical Model to Predict Oil Reservoirs Performance Using Mechanical Waves Propagation

Key Words:

Seismic stimulation; EOR Analytical Predictive Models; Wave induced fluid flow theory; Mechanical waves EOR; Unconventional EOR Techniques.

Summary:

This study is implemented to develop an analytical model to predict the performance of the mechanical waves as an EOR technique. Several factors that affect the wave propagation profile have been incorporated in the model. In addition, several affection mechanisms of the wave on the reservoir were considered. The model was validated against some lab experiments along with field cases. A sensitivity analysis was implemented to specify the optimum application ranges of the wave source and reservoir rock and fluids characteristics.

Disclaimer

I hereby declare that this thesis is my own original work and that no part of it has been submitted for a degree qualification at any other university or institute.

I further declare that I have appropriately acknowledged all sources used and have cited them in the references section.

Name: Date:

Signature:

Dedication

To my family, my professors, and my friends.

Acknowledgments

First of all, I would like to express my endless thanks to **Allah** for guiding me and giving me the ability and patience to perform this research.

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Finally, I really wish nothing more than to make all of you proud.

Hehsam Ahmed Abo-Zaid

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