



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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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.

I want to thank my entire family for supporting me to achieve my dream. They provided me with the appropriate working environment and always gave me the motivation that encouraged me to continue.

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Hehsam Ahmed Abo-Zaid

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