

Successful Implementation of Separate Layer Steam Injection to Enhance Oil Production from Comingle Layers- FNE-28 Case Study

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Abstract

FNE Oilfield is geographically located in the southwest of Sudan, about 700 km from the capital, Khartoum; structurally located in the northeast of Fula sub-basin of Muglad basin and in the southwest of the Moga Oilfield, and has a long narrow structure from northwest to southeast, the biggest length of northwest-southeast is about 10 km, the average width of northeast-south is about 1.5 Km. The field oil bearing area is around 12 Sq Km. The overall terrain in FNE Field is higher in the southwest and lower in the northeast

FNE Oilfield exploration began in 1989, the first well FNE-1 has been drilled in 2005, and then immediately the development and research began. The oilfield development Case was completed in May 2008 and concluded to go for thermal enhanced oil recovery, Cyclic Steam Stimulation (CSS) has been implemented in since 2010 currently about 80 wells under CSS, some of the wells reach the 6 cycle.

During steam injection the steam distribute non-uniform because of reservoir heterogeneity and effect of steam gravity segregation, the Productivity of upper zones is better than that is of bottom zones and layer with excellent productivity continued to be improved with cycles, while other zones tended to be worse, and the production has been affected by steam distribution and adsorption per layer.

In this paper the well selection, designing, Implementation of Separate Layer Steam Injection/ Production from Comingle layers, steam distribution and adsorption as well as production analysis before and after will be studied and analyzed.

The results show that the production performance of FNE-28 has been improved the cumulative oil production increased almost five times compared to last cycle and the cycle duration been extended for more than two years.

Biography

Husham A. Elbaloula is a Simulation Engineer at Petro-Energy-E&P and PHD Candidate , Lecturer & Researcher in Sudan University of Science and Technology, He has Nine (9+) years of diverse experience in oil and gas field development planning, Performance review, Reservoir Simulation, Reservoir Management and IOR/EOR, He earned BSc and Msc. In Petroleum Engineering from Sudan University of Science and Technology College of Petroleum Engineering & Technology and currently he is Petroleum Engineering PHD candidate in the same College, He has participated in more than 15 local and international Technical workshops, Conferences and symposium in (Sudan, KSA, UAE, India, Bahrain, Morocco and Canada), He has published eight (8) journals and conference papers, Reviewer for SPE & IEOM and participated in five (5) Enhanced Oil Recovery projects in Sudanese Oil fields, and Conduct more than 15 training courses in the area of IOR/EOR for different training centers and companies.

He is working as Lecturer and Researcher Sudan University of Science and Technology College of Petroleum Engineering & Technology since 2013 up now.

Volunteering in SPE as Young Professional Chairperson – Sudan Section and SPE Ambassador Lecturer & President for IEOM SUST Student Chapter 2017

Dr. Tagwa Ahmed Musa is an Associate Professor of Petroleum Engineering at Sudan University of Science and Technology (SUST) as well as; the Dean of College of Petroleum Engineering and Technology since 2014. She has an extensive research and teaching experience in addition to significant contribution to academic, research and community service programs both locally and internationally. She is the first Sudanese woman to receive a PhD in the Petroleum Engineering field. In 2017th she received the *IEOM Women in Industry and Academia Award*

Dr. Musa served in leading committees of several professional societies and she is currently a member of the Society of Petroleum Engineers (SPE), Sudan Association of Petroleum Geoscientist (SAPEG), Sudan Engineering Society, and Global Engineering Deans Council. She published more than 20 papers in peer reviewed journals and conferences. Also, she participated in organizing many conferences and served in technical committee for others (e.g., NATC, MEALF, and EGYPS). Dr. Tagwa is a member of the Editorial Board of several scientific journal including HRPUB and JNES. She also worked as an External Examiner for several universities around the globe, including the Department of Petroleum and Energy Dodoma University in Tanzania (from 2012 to 2017), as an External Funded Project Reviewer for the Universiti Teknologi Petronas Malaysia (UTP), and reviewer the promotion dossiers for the University of Hadramout in Yemen. Dr. Musa served as the Chair of the SPE-Sudan Section in 2017-2018 and currently she is serving as the Director of SPE Sudan Section, the Faculty Advisor of SPE and IEOM Students' Chapter at SUST. Furthermore, she is a member of the Consultancy Council of Sudan's Ministry of Oil and Gas, the Ministry of Higher Education Engineering and Technicians Studies as well as the Assessment of Sudanese Engineering Colleges Committees.

Dr. Tagwa has a BSc with First Class Honors degree from Sudan University of Science and Technology, MEng and PhD from China University of Geosciences; all in Petroleum Engineering.

Luo Shengyong is a senior production engineer of Great Wall Drilling Company (GWDC) of China National Petroleum Corporation . he has twelve (12) years' experience in oil and gas production, especially in heavy oil production technology, such as production design , technical support, trouble shooting at wellsite. In the past several year, he undertook and as a member participated into several projects study, one national level and three company level projects.