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| Book Name: | [**Science and Technology: Developments and Applications**](https://www.bookpi.org/bookstore/product/science-and-technology-developments-and-applications-vol-1/) |
| Manuscript Number: | **Ms\_BPR\_4706** |
| Title of the Manuscript:  | **Mechanical performance of bentonite plugs in abandonment operations of petroleum wells** |
| Type of the Article | **Book Chapter** |

**Special note:**

**A research paper already published in a journal can be published as a Book Chapter in an expanded form with proper copyright approval.**

**Source Article:**

**This chapter is an extended version of the article published by the same author(s) in the following journal.**

**Resources, 13(8): 1-11, 2024.**

**DOI:** [**https://doi.org/10.3390/resources13080103**](https://doi.org/10.3390/resources13080103)

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| PART 1: Comments |
|  | Reviewer’s comment**Artificial Intelligence (AI) generated or assisted review comments are strictly prohibited during peer review.** | Author’s Feedback *(Please correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)* |
| **Please write a few sentences regarding the importance of this manuscript for the scientific community. A minimum of 3-4 sentences may be required for this part.** | The manuscript presents a thorough investigation into the mechanical performance of bentonite plugs used in the abandonment of petroleum wells. It addresses a significant gap in the literature regarding the influence of operational procedures and subsurface conditions on the integrity of these plugs. The findings are relevant for both the petroleum industry and environmental safety, as they provide insights into alternative materials for well abandonment that may be more effective and economical than traditional cement plugs.**This manuscript is important for the scientific community as it explores the mechanical properties of bentonite plugs, which are increasingly being considered as alternatives to cement in well abandonment operations. The study highlights the impact of different operational procedures and environmental conditions on the performance of these plugs, providing valuable data that can inform best practices in the industry. Furthermore, the research contributes to the ongoing discourse on sustainable practices in petroleum decommissioning, making it a relevant addition to the field.** |  |
| **Is the title of the article suitable?****(If not please suggest an alternative title)** | **Yes, the title is suitable as it clearly reflects the content and focus of the manuscript. An alternative title could be: "Evaluating the Mechanical Integrity of Bentonite Plugs in Petroleum Well Abandonment: Operational Procedures and Environmental Impacts."** |  |
| Is the abstract of the article comprehensive? Do you suggest the addition (or deletion) of some points in this section? Please write your suggestions here. | **The abstract is comprehensive and effectively summarizes the objectives, methodologies, and key findings of the study. No additions or deletions are necessary.** |  |
| **Is the manuscript scientifically, correct? Please write here.**  | **Yes, the manuscript is scientifically correct. The methodologies are well-defined, and the results are presented clearly. The discussion effectively interprets the findings in the context of existing literature.** |  |
| **Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.****-** | **The references are sufficient and mostly recent, covering relevant studies in the field. However, it may be beneficial to include more recent studies on the environmental impacts of well abandonment and the use of alternative materials in decommissioning operations.****Kianoush, P., Mesgari, F., Jamshidi, E., Gomar, M., Kadkhodaie, A., Varkouhi, S., 2024b. Investigating the effect of hole size, bottom hole temperature, and composition on cement bonding quality of exploratory wells in Iran. Scientific Reports 14, 29653.https://doi.org/10.1038/s41598-024-81269-2****Saffari, M., Ameri, M., Jahangiri, A., Kianoush, P., 2024. Development of rheological models depending on the time, temperature, and pressure of wellbore cement compositions: a case study of southern Iran’s exploratory oilfields. Arabian Journal of Geosciences 17, 175.https://doi.org/10.1007/s12517-024-11982-9****Kianoush, P., Gomar, M., Keshavarz Faraj Khah, N., Hosseini, S., Kadkhodaie, A., Varkouhi, S., 2025. Designing multi-function rapid right angle set slurry compositions for a high pressure-high temperature well. Results in Earth Sciences 3, 100069. https://doi.org/10.1016/j.rines.2025.100069****Pirhadi, A., Kianoush, P., Ebrahimabadi, A., Shirinabadi, R., 2023. Wellbore Stability in a Depleted Reservoir by Finite Element Analysis of Coupled thermo-poro-elastic Units in an Oilfield, SW Iran. Results in Earth Sciences 1, 100005.https://doi.org/10.1016/j.rines.2023.100005****Pirhadi, A., Kianoush, P., Varkouhi, S., Shirinabadi, R., Shirazy, A., Shirazi, A., Ebrahimabadi, A., 2025. Thermo-poroelastic analysis of drilling fluid pressure and temperature on wellbore stresses in the Mansouri oilfield, SW Iran. Results in Earth Sciences 3, 100061.https://doi.org/10.1016/j.rines.2025.100061** |  |
| Is the language/English quality of the article suitable for scholarly communications? | Yes, the language and English quality of the manuscript are suitable for scholarly communication. The writing is clear, concise, and free of grammatical errors. |  |
| Optional/General comments | The manuscript is well-structured and presents a significant contribution to the field of petroleum engineering and environmental science. The authors have done a commendable job in addressing the research questions and providing a comprehensive analysis of the results.The manuscript is well-prepared and presents valuable findings. It is recommended for publication with minor revisions to enhance clarity in some sections. |  |

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| **PART 2:**  |
|  | **Reviewer’s comment** | **Author’s comment** *(if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)* |
| **Are there ethical issues in this manuscript?**  | *(If yes, Kindly please write down the ethical issues here in details)* |  |

**Reviewer details:**

**Pooria Kianoush, Islamic Azad University, Iran**