Response to Reviewer 3 Comments

First of all, the authors would like to express their sincere gratitude to you for the valuable comments which have greatly improved this paper. The revisions are clearly highlighted in revision and the explanations of your comments point-by-point are shown as followings:

Point 1: Keywords need to be modified. Please use words not combinations of words or phrases.

Response 1: It has been improved in the revision.

Point 2: In the Introduction section, an enhanced literature review is required. For this study, the authors have used only 23 reference sources. It seems insufficient for such type of research. It will be great if the authors show some description in context – Why it is important to conduct this study?

Response 2: The Introduction has been great improved in the revision. An enhanced literature review and the explains of the novelty and application of this work have been added in the Introduction.

Point 3: Can the expected result be used or implemented within other geological conditions? If yes, then how? What limitations?

Response 3: The goals of this study were to provide technical support for multi-stage filling mining in the study area and to provide a reference for other mining projects with similar geological conditions. The main content of this paper is the damage and failure characteristics of the back-fill-surrounding rock contact zone. Thus, the expected research results can provide reference for the stability evaluation of all backfill mining mines.

Point 4: The aim and the tasks must be highlighted at the end of the Introduction section.

Response 4: It has been improved in the revision.

Point 5: Figure 2 is unclear. Please add more details in the description of the legend.

Response 5: It has been improved in the revision.

Point 6: You should add what does mean rich and poor ore. What is the classification.

Response 6: It has been added in the section 2.2 of the revision.

Point 7: Section 2.1. What does the Project description mean?

Response 7: The 'Project description' has been changed to 'Engineering geological condition'.

Point 8: Boundary conditions should be given in more details.

Response 8: The complete detail about the modelling part has been added in the section 3.2, and the boundary condition has been supplemented in section 3.3 of the revision.

Point 9: The novelty of the paper must be highlighted in the conclusions section.

Response 9: The Conclusions has been improved in the revision.

Point 10: Please provide a short description of further research.

Response 10: It has been added in the end of the manuscript.

Point 11: Comparison with the previously achieved results are welcome.

Response 11: It has been improved in the revision.

Point 12: There are papers that I have reviewed in the past years. Please consider the suggested research in your paper when enhancing the literature review (Be aware that there are no references that belong to the reviewer). I believe they are worth considering in your paper.

1. Iordanov, I., Novikova, Yu., Simonova, Yu., Yefremov, O., Podkopayev, Ye., & Korol, A. (2020). Experimental characteristics for deformation properties of backfill mass. Mining of Mineral Deposits, 14(3), 119-127. https://doi.org/10.33271/mining14.03.119

2. Takhanov, D., Muratuly, B., Rashid, Z., & Kydrashov, A. (2021). Geomechanics substantiation of pillars development parameters in case of combined mining the contiguous steep ore bodies. Mining of Mineral Deposits, 15(1), 50-58. https://doi.org/10.33271/mining15.01.050

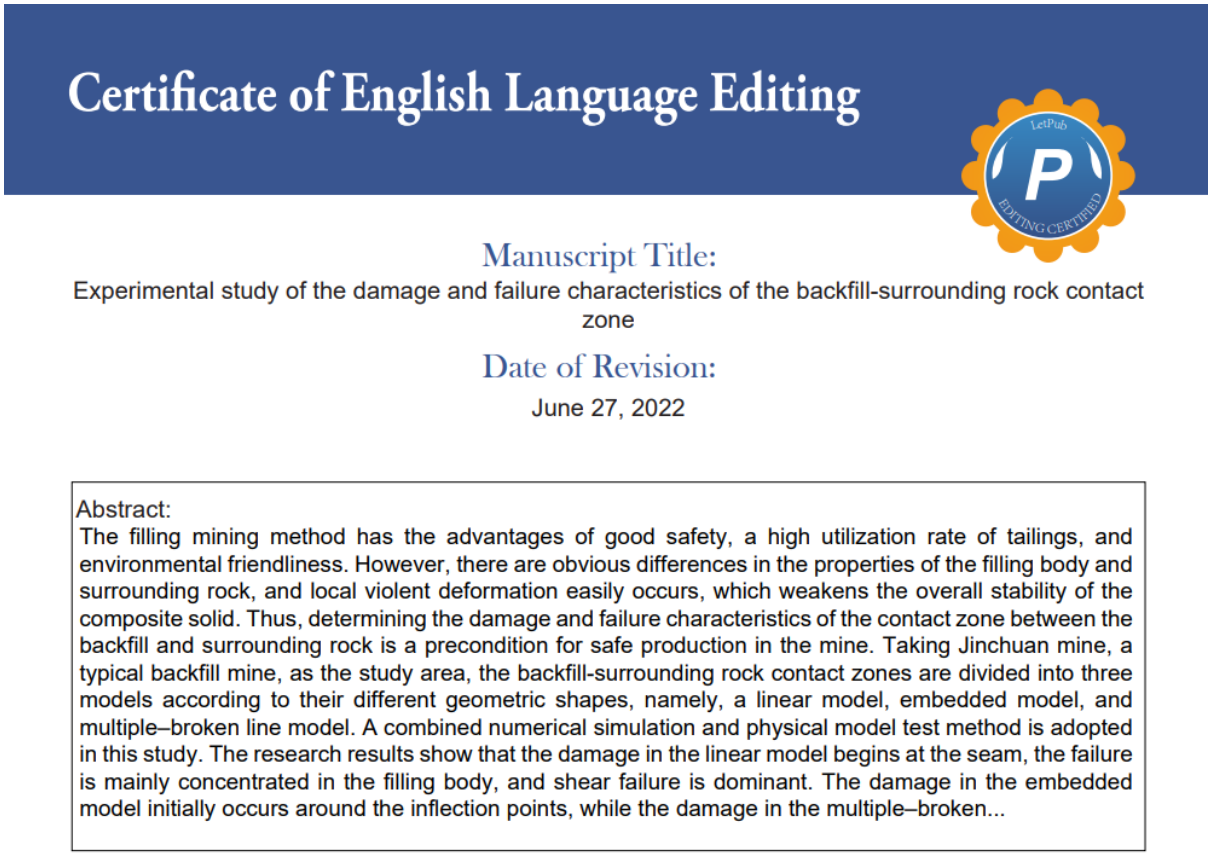
3. Ghazdali, O., Moustadraf, J., Tagma, T., Alabjah, B., & Amraoui, F. (2021). Study and evaluation of the stability of underground mining method used in shallow-dip vein deposits

hosted in poor quality rock. Mining of Mineral Deposits, 15(3), 31-38. https://doi.org/10.33271/mining15.03.031

Response 12: The suggested researches have been seriously considered in improving the revision.

Point 13: In general, I must admit that a very good study was performed, and I will recommend your paper for publication after careful revision.

Response 13: Thank you for your approval. According to the comments of all reviewers, authors made a major revision to the manuscript. And, the language in the manuscript has been polished by a professional language editing service, and the certificate is shown as follows:



Certificate of English Language Editing

Manuscript Title:

Experimental study of the damage and failure characteristics of the backfill-surrounding rock contact zone

Date of Revision:

June 27, 2022

Abstract:

The filling mining method has the advantages of good safety, a high utilization rate of tailings, and environmental friendliness. However, there are obvious differences in the properties of the filling body and surrounding rock, and local violent deformation easily occurs, which weakens the overall stability of the composite solid. Thus, determining the damage and failure characteristics of the contact zone between the backfill and surrounding rock is a precondition for safe production in the mine. Taking Jinchuan mine, a typical backfill mine, as the study area, the backfill-surrounding rock contact zones are divided into three models according to their different geometric shapes, namely, a linear model, embedded model, and multiple–broken line model. A combined numerical simulation and physical model test method is adopted in this study. The research results show that the damage in the linear model begins at the seam, the failure is mainly concentrated in the filling body, and shear failure is dominant. The damage in the embedded model initially occurs around the inflection points, while the damage in the multiple–broken...