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To the editors of *Journal of Geophysical Research – Solid Earth*,

Please find attached our manuscript entitled **"Analytical Model and Experimental Testing of the Limits of Hydraulic Fracture Caging"**. In this manuscript, we explore the injection rate, pressure, and design limits of fracture caging with the goal of reliably capturing and containing hydraulic fractures in the subsurface. Facture caging holds promise for enabling control over injection induced seismic risk and for improving the performance of geothermal systems by an order of magnitude. Caging is the placement of boundary wells around injection wells (before injection begins) to contain high-pressure injected fluids. Unlike conventional approaches, caging safely enables high-rate injection (e.g., >0.1 m^3/s; >38 bbl/min) without a pressure limit. These high rates are crucial for bringing geothermal to the forefront of the energy mix where it has potential to provide more than 100 GWe of baseload power generation in the US alone. Our results are not under consideration by another journal nor have they been previously published.

To be clear, this is our second attempt to publish these new results in JGR because we strongly feel that this is the most suitable journal for this work. Motivated by the feedback we received from the associate-editor and editor-in-chief, we have expanded our work and improved its applicability by adding a new analytical model. Crucially, it appears that we were previously unclear about the fracture caging process and how *the boundary wells are the mechanism for halting and containing hydraulic fractures despite continued injection*. With caging, there is no "criterion to stop the hydraulic fracturing" as the associate-editor inquired about. Instead the boundary wells do this automatically as long if they are open to flow and they intersect the hydraulic fracture. Unlike our prior work which failed to validate this halting effect due to low-volumes of fluid injection (1.1 mL before versus >100 mL now), the stimulation-rate injection in these new experiments continued long after the fracture was confirmed to have halted due to caging. The improvement to the experiments, completion of six wholly new experiments, and development of an analytical model to predict the upscaled behavior of caging in field-scale geothermal systems should now more clearly elucidate the value of our work to the scientific community.

In brief, we have implemented the following improvements: (1) Improved the data repository to provide all pertinent data in accessible formats, including videos of the experiments; (2) Removed confusing multi-perspective images of the experiments because the additional views were not beneficial; (3) Developed and added a new analytical model to predict upscaled injection rate limits for commercial-scale systems; (4) Completely re-wrote the manuscript to incorporate feedback, improve clarity, and discuss the broader implications of our discoveries; and (5) Added a comparison of predicted-uncaged and measured-caged fracture radii to clarify how boundary wells *are* the mechanism for trapping hydraulic fractures. We greatly appreciate the editor's previous comments for inspiring these improvements.

We trust we have clearly demonstrated the scientific and societal impact of our recent discoveries. We hope that you now agree that this work is worthy of publication in Journal of Geophysical Research.

Sincerely and on behalf of all the authors,
Luke P. Frash

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