

A Workflow for Selection of Stimulation Candidates in the Deep Basin

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The Deep Basin gas play in Western Canada has been recognized since 1975 as an immense gas resource, the size of which has still not been determined. It is located on the eastern flank of the Rocky Mountain Foothills. The tight, abnormally pressured pools of North-Eastern British Columbia and West-Central Alberta have been shown to respond favorably to refracturing and other types of stimulation. This may represent a very large underexploited resource. Figure 1 shows the study area.

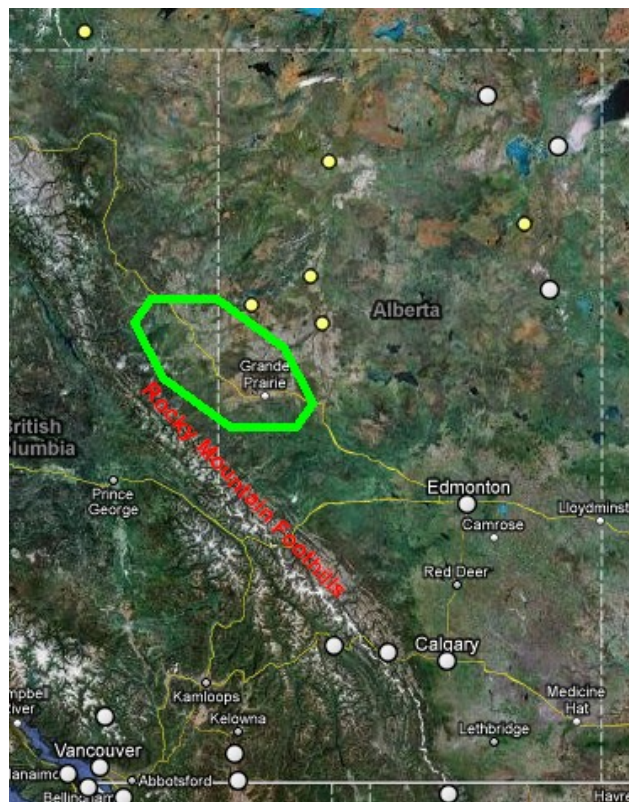


Figure 1: Study area outlined in green

This paper presents a workflow for identifying candidates for refracturing and other forms of stimulation. From the public Canadian data store, we extracted and reviewed the results of 576 previous treatments from several pools within the Deep Basin. We used self-organizing-maps, of which an example is displayed in Figure 2, to analyse the pre- and post-treatment performance and characteristics of each well. This enabled us to identify the pre-treatment criteria which would produce the highest likelihood of success.

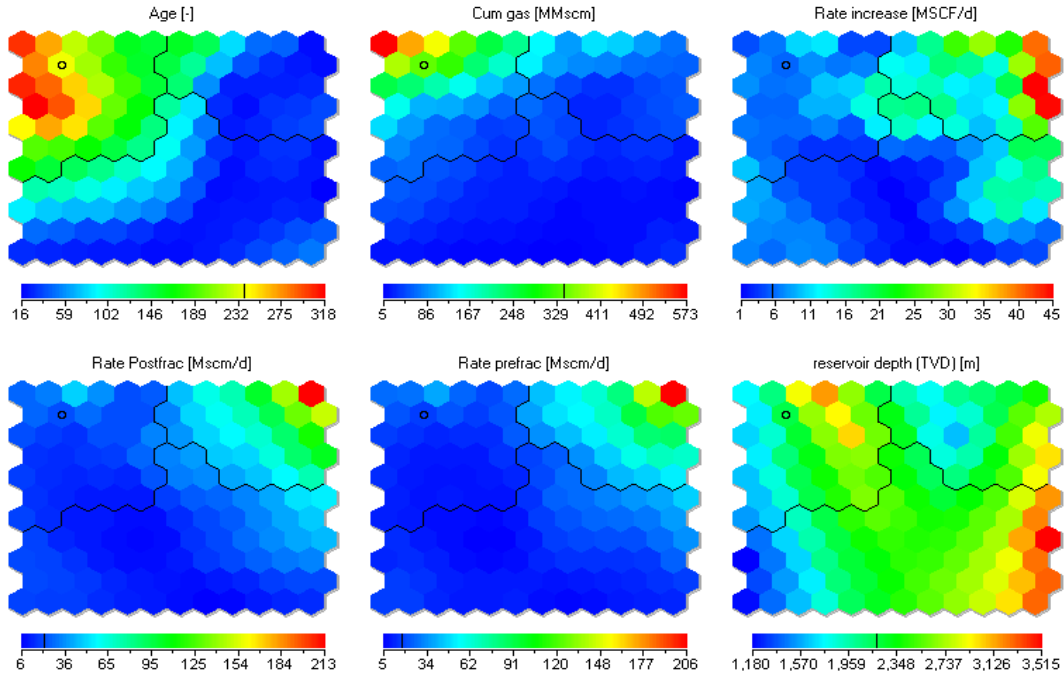


Figure 2: Self organizing map

To test this hypothesis, we selected a sample of wells, all of which had recent treatments, and hid the performance data from the date of each stimulation treatment onward. We applied the previously identified criteria and selected those wells likely to have a successful outcome. Decline analysis was performed to predict the production rates with and without the stimulation. The actual results were revealed and analyzed for validation of the workflow. To evaluate the financial impact, economic analyses were completed ensuring the validity of the selection criteria.

This validated workflow has the potential to be applied to this gas play or other reservoirs. It can be used to:

- Make quicker candidate selection decisions
- Maximize the probability of increased production
- Optimize well treatment investments