ADVANCED TECHNOLOGIES FOR STRIPPER GAS WELL ENHANCEMENT

QUARTERLY REPORT

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ABSTRACT

As part of Task 1 in the Advanced Technologies for Stripper Gas Well Enhancement, Schlumberger – Holditch Reservoir Technologies (H-RT) has partnered with two Appalachian Basin producers, Great Lakes Energy (formerly Range Resources) and Belden & Blake Corporation, to develop methodologies for the identification and enhancement of stripper wells with economic upside potential. These industry partners have provided data for over 700 wells in northwestern Pennsylvania.

Phase 1 goals of this project are to develop and validate methodologies that can quickly and cost-effectively identify wells with enhancement potential. We are currently in the final stages of developing and testing our new Access/Excel based software and processing this well data to generate a list of potential candidate wells that can be used in Phase 2 to validate these methodologies.

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INTRODUCTION

During this report period, we have continued to work and meet with two industry partners, Great Lakes Energy (formerly Range Resources) (GLE), and Belden & Blake Corp (B&B). We have received, and are analyzing, production data, well location coordinates, and base map information from both partners. GLE supplied data for approximately 205 wells located in Warren, Venango, and Crawford counties, Pennsylvania. B&B supplied data for nearly 501 wells in Venango and Warren counties, Pennsylvania. During a meeting with B&B, to review our preliminary results, they indicated that we did not have a complete well list from their field. They are currently updating the field information and will supply it to us. We will then update our database and reanalyze the area. Using the existing data we are finalizing the Access/Excel software routines and reviewing the entire data entry and processing procedure for errors.

EXPERIMENTAL

We are using and developing software tools to evaluate the production data and conduct a quick, first-pass examination for wells with enhancement potential. Using these tools, we generate a single Production Indicator (PI) that is representative of the entire production life of a well. The current software has the ability to calculate two PI's, a cumulative gas at a user input time period (i.e. 1 yr, 2 yr, 5 yr, etc.), and an average gas rate over the life of the well (cumulative gas/months produced). We then can compare either PI of a given well to the surrounding wells within a user input radius (i.e. 4000ft) and look for wells within that radius that perform significantly below the statistical reference of the offset wells. The software compares the PI of the target well to the average of its offsets and the user can input a percentage (50%) that the target well needs to be below the average. The software will then process the entire well list and only presents target wells that meet the input criteria. This gives a quick, automated method to identify wells that are under-performers in an area and that may have potential for production enhancement.

We are also concluding our development of a software routine that will detect excessive changes in the production decline of a well. Identifying these abrupt changes could help identify wells that have incurred a mechanical wellbore problem over time.

Once this first pass is completed and we have identified a group of wells that may have enhancement potential, we will work with the industry partners to review completion, geologic, and production data in more detail. This will further refine the list and establish a good foundation for a Phase II field demonstration.

RESULTS AND DISCUSSION

The well data has been downloaded into Microsoft ACCESS™ databases and has been quality-checked for internal errors or omissions. B&B did indicate that some wells may be missing in the current database and are working on updated information.   The database has been linked to a new Microsoft Excel file specifically designed to aid in recognizing wells with possible production enhancement potential.   A user-friendly interface has been of paramount importance in making the program relatively easy to use by the operators.

CONCLUSION

We have received data for more than 700 wells and are in the final stages of identifying wells with possible production enhancement potential. The software for well identification is in its final stage of development and when completed will provide an easy and fast way to identify wells that may have upside potential. From our experience in the Appalachian Basin, we are confident that a good sample of stripper wells with enhancement potential can be found in this data set. We are also confident that the methodologies developed to date can quickly and economically select stripper wells with economic upside potential.   By accomplishing this, we will provide producers throughout the U.S. a means of increasing existing gas production and increase the U.S. natural gas reserve base.