

## Jury Member Report – Doctor of Philosophy thesis.

**Name of Candidate:** Tatiana Bondarenko

**PhD Program:** Petroleum Engineering

**Title of Thesis:** Evaluation of high-pressure air injection potential for in-situ synthetic oil generation from oil shale: Bazhenov Formation

**Supervisor:** Prof. Alexey Cheremisin

**Chair of PhD defense Jury:** Prof. Alexei Buchachenko

**Email:** *a.buchachenko@skoltech.ru*

**Date of Thesis Defense:** December 03, 2018

**Name of the Reviewer:** Prof. Dmitry Koroteev

I confirm the absence of any conflict of interest

(Alternatively, Reviewer can formulate a possible conflict)

**Signature:**



**Date: 21-11-2018**

### Reviewer's Report

This report should be presented to the Ph.D. defense Jury at Tatiana Bondarenko's Ph.D. thesis defense.

First of all, I must admit the high quality of the thesis text and its supplementing materials e.g. figures and tables. I rarely see a research work being presented and structured so well. All the chapters are in line with the objectives reflected in their titles and one can easily follow the overall logic of the thesis.

The topic of the thesis very relevant to the actual challenges of the oil and gas industry worldwide as it touches the fundamental problem of unconventional hydrocarbon resources. There are very few research studies aimed at the quantitative description of the efficiency of various approaches to the production of oil from shales. Tatiana's thesis represents one of the most detailed experimental studies on the in-situ synthetic oil generation at a high-pressure air injection to the shale-rich Bazhenov formation.

Tatiana has had an access to an absolutely unique experimental setup allowing a wide range of pressures, temperatures, chemical, and geological compounds to be studied during a dynamical process of the air injection. The setups are equipped with the top-notch sensors and data-collection systems. Tatiana's thesis clearly demonstrates that the experimental facilities have been utilized with a highly professional research approach. The experimental data has been processed, analyzed, and summarized rather well. The overall conclusion representing the schematics of the high-pressure air injection in shales accounting for the temperature profile, kerogen conversion, and zones in a Bazhenov rock has no analogs worldwide.

Tatyana's results are of a very high demand for industrial applications which is highlighted by the participation of LUKOIL in the project.

Publications written by Tatiana are highly rated. I would like to highlight three papers in the Journal of Petroleum Science and Engineering which is one of the benchmarks of the oil-related research all over the world.

Summing up the above consideration, I definitely support Tatiana Bondarenko in her effort on defending the Ph.D. thesis. I do recommend the respectful Jury to approve the Ph.D. status of Tatiana.

**Provisional Recommendation**

*I recommend that the candidate should defend the thesis by means of a formal thesis defense*

*I recommend that the candidate should defend the thesis by means of a formal thesis defense only after appropriate changes would be introduced in candidate's thesis according to the recommendations of the present report*

*The thesis is not acceptable and I recommend that the candidate be exempt from the formal thesis defense*