**Economic Analysis using GEOPHIRES**

The purpose of this document is to describe the contents of information contained within a submission to the Geothermal Data Repository (GDR) node of the National Geothermal Data System (NGDS) in support of Feasibility of Deep Direct-Use Geothermal on the West Virginia University Campus-Morgantown, WV.

**Abstract**: This dataset contains all the inputs used and output produced from the modified GEOPHIRES for the economic analysis of base case hybrid GDHC system, improved hybrid GDHC system with heat pump and for hot water GDHC. Detailed descriptions of the contents of this repository are provided below.

**Key Words**: Appalachian Basin, West Virginia University, GEOPHIRES, LCOH, Hybrid Geothermal natural gas system, Deep direct-use.

**Citation**: When referencing this data, please use the following citation information:

**Title**: WVU DDU: GEOPHIRES Analysis Results for GDHC at WVU campus, Morgantown, WV

 **Author(s)**: West Virginia University

 **Date**: January 9, 2020

**Software Requirement Note:**

GEOPHIRES open source code, Microsoft Notepad, Microsoft Excel.

**Contents of Submission**:

**Folder: GEOPHIRES**

Contains the input data, and output results for the economic analysis.

**Contents**

1. **File: GEOPHIRES Parameter.docx**

The subsurface, surface, financial, capital cost and O&M parameters used in this study are listed.

1. **Folder: HybridGDHC**
2. **Folder: GDHC**
3. Correlations

Input and output files of LCOH analysis for hybrid GDHC system using GEOPHIRES correlations for well drilling and completion costs, with an adjustment factor of 1.5 for horizontal wells.

1. NNECosts

Input and output files of LCOH analysis for hybrid GDHC system using well drilling and completion costs obtained through the quotes from Northeast Natural Energy (NNE).

1. **Folder: GDHC\_HeatPump**
2. Correlations:

Input and output files of LCOH analysis for improvised hybrid GDHC system using GEOPHIRES correlations for well drilling and completion costs, with an adjustment factor of 1.5 for horizontal wells.

1. NNECosts

Input and output files of LCOH analysis for improvised hybrid GDHC system using well drilling and completion costs obtained through the quotes from Northeast Natural Energy (NNE).

1. **File: UQAnalysis**
2. Correlations

Input and output files of LCOH analysis for improvised hybrid GDHC system using the temperature profile obtained in uncertainty analysis using iTOUGH2, and using default well drilling and completion costs.

1. NNECosts

Input and output files of LCOH analysis for improvised hybrid GDHC system using the temperature profile obtained in uncertainty analysis using iTOUGH2, and using the NNE quotes for well drilling and completion costs.

1. **Folder: HotWaterSystem**
2. **Folder: 40**

Input and output files for LCOH analysis of hot water system with a production flow rate from each well as 20 kg/s and for every two-production wells, one injection well is considered. The wells are horizontal and well drilling and completion costs is obtained through the quotes from Northeast Natural Energy (NNE).

1. **Folder: 80**

Input and output files for LCOH analysis of hot water system with a production flow rate from each well as 40 kg/s and for every two-production wells, one injection well is considered. The wells are horizontal and well drilling and completion costs is obtained through the quotes from Northeast Natural Energy (NNE).

1. **Files: Economics\_BaseCase.xlsx; Economics\_Improved.xlsx; Economics\_HotWater.xlsx**

Results of LCOH analysis for base case hybrid GDHC, improved hybrid GDHC system and preliminary analysis for hot water system.