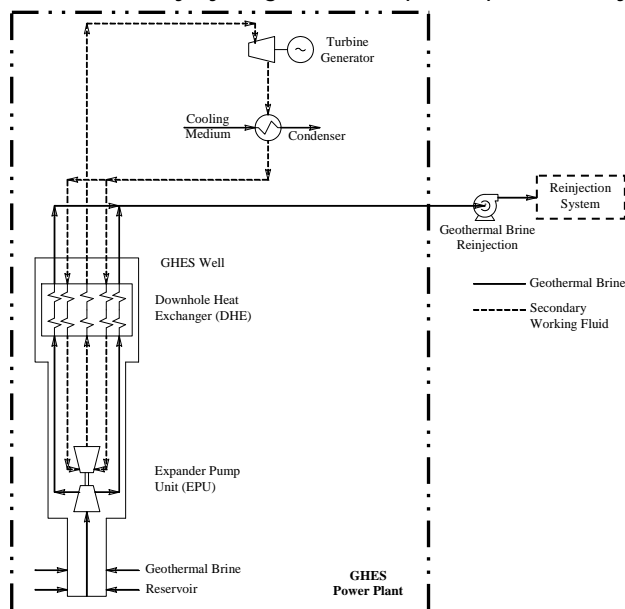


The Gravity Head Energy System (GHES) is an innovative technology designed by GeoTek Energy resulting in:

- Improved plant efficiency.
- A significant reduction in environmental impact.
- Elimination of costly geothermal brine field gathering system.
- A simplified wellhead based power plant versus the traditional central power plant concept.

### APPLICATION

The GHES, as shown in the following sketch, is a unique application of the traditional Organic Rankine Cycle (ORC) currently used in conventional industry standard binary cycle geothermal power plants today.



The unique features of the GHES technology are:

- Heat exchange between the geothermal brine and the working fluid occurs in the well.
- Parasitic load associated with the conventional Geothermal Brine Well Pump is eliminated by the use of the GHES Expander Pumping Unit.
- Gravity is used to pressurize the working fluid eliminating the parasitic load associated with the conventional Secondary Working Fluid Feed Pump.

### TECHNOLOGY OVERVIEW

The secondary working fluid flows down the well and is heated by the up-flowing hot geothermal brine in the Downhole Heat Exchanger (DHE). The DHE is a specially designed vertical shell-and-tube heat exchanger matched to a specific geothermal resource through thermodynamic computer modeling. As the heated working fluid continues flowing down the well, its pressure increases due to the gravity head effect. At the EPU, the heated high-pressure working fluid is fed to the expander to provide the necessary energy to drive the brine pump. The brine pump is direct coupled to the expander and keeps the brine flowing through the system and ultimately to the surface. The working fluid exhaust from the EPU is a high-energy stream that flows back up the well to the surface turbine/generator set to produce power. The working fluid that exits the turbine is then condensed and returned to the well to repeat the cycle. The geothermal brine, with its heat extracted, is then reinjected as in conventional geothermal applications.

The GHES technology is optimized for any given resource utilizing a Thermodynamic Assurance Model custom developed by GeoTek. The computer model enables a thorough analysis of power output as a function of fluid conditions, working fluid selection, EPU location, DHE size location, general well configuration, reservoir properties, and reservoir behavior.

### FOR MORE INFORMATION

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