Aspen Geolog™ Supports Subsurface Projects for a Lower Carbon Future

Aspen Geolog is the industry-leading solution for advanced formation evaluation and petrophysical analysis. Its versatility makes it well suited to a diverse number of energy industries such as carbon sequestration and geothermal energy development. It enables informed decisions by assessing and analyzing a reservoir's physical, geomechanical and fluid properties.

Key Benefits

- The flexibility of Aspen Geolog enables it to easily adapt its well-proven technologies to low-carbon applications.
- The broad data model provided by Aspen Geolog helps accurately describe the downhole environment in geothermal and carbon sequestration projects.
- A fully scalable solution using Python scripting and Aspen Geolog's powerful Loglan programming language enables customization to low-carbon applications, such as borehole data visualization, plotting and interpretation for offshore wind projects.
- Vendor independence gives users the freedom to analyze and interpret wellbore data acquired with any tool.
- Integration with Aspen SeisEarth™, Aspen SKUA™ and Aspen RMS™ delivers a seamless workflow.

Key Capabilities — Aspen Geolog for Carbon Storage

Formation evaluation is critical to defining the feasibility of the reservoir for carbon storage. Aspen Geolog offers comprehensive capabilities for multiple carbon storage project stages, from characterization to monitoring:

- Perform fast and accurate machine learning and cluster analysis using Aspen Geolog Facimage™, to gain insights into facies heterogeneities impacting CO_2 flow
- Identify and assess critically stressed fractures and faults, ensuring storage seal integrity
- Estimate pore pressure to ensure wellbore strength during CO_2 injection
- Evaluate well construction and integrity to prevent potential leak pathways

- Quantify uncertainty associated with petrophysical analysis and assess its impact on carbon storage properties
- Leverage the Geolog Export to PDF functionality to directly report to regulators
- Use time-lapse views to monitor CO_2 behavior and wellbore conditions (Figure 1)
- Interpret fiber-optic sensor data, pressure, temperature logs and water samples for subsurface monitoring during CO_2 injection and sequestration
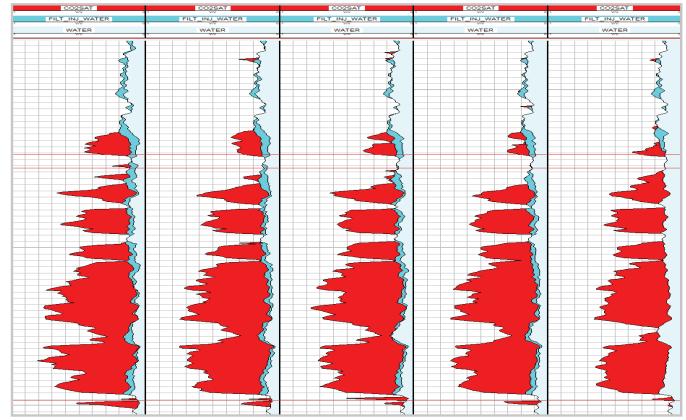
Figure 1. Pulsed Neutron Capture Logging (PNL) - A dedicated time-lapse view showing changes in formation fluids and mechanical integrity over time, due to the migration of injected CO_2.

"I previously used Aspen Geolog in the hydrocarbon exploration and production industry, where the system's ease of us and powerful Python scripting capabilities significantly contributed to the workflow efficiency. I found that Aspen Geolog easily makes the transition to Carbon Storage. We're currently using Aspen Geolog for Carbon Storage exploration; we will soon begin drilling, and plan to continue using Aspen Geolog for monitoring and surveillance."

—Adam Haeker

Director of Geoscience, Milestone Carbon

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Key Capabilities — Aspen Geolog for Geothermal Energy Development

Aspen Geolog provides extensive capabilities for conducting formation evaluation of geothermal reservoirs. It is suitable for diverse geological environments and various types of geothermal systems, enabling power generators to optimally harness the Earth's natural heat.

- Interpret well logs for geothermal reservoir characterization and heat extraction capacity

- Analyze borehole temperature to identify optimal intervals for geothermal resource exploitation

- Perform water analysis to characterize the geothermal system and monitor its production (Figure 2)

- Evaluate cores, images, logs, drilling data and production logs for natural fractures and faults impacting fluid flow and heat distribution

- Assess in-situ formation thermal properties (radiogenic heat production, heat capacity, thermal conductivity and thermal diffusivity) using well logs and petrophysical interpretation results

- Assess mechanical conditions around the wellbore for well stability prediction, drilling pressure limits and cement design

"Eavor Technologies Inc. is actively applying AspenTech Subsurface Science & Engineering solutions in its geothermal exploration activities, building a compilation of worldwide geothermal assessments that help guide our business investment decisions."

—Todd Stuebing

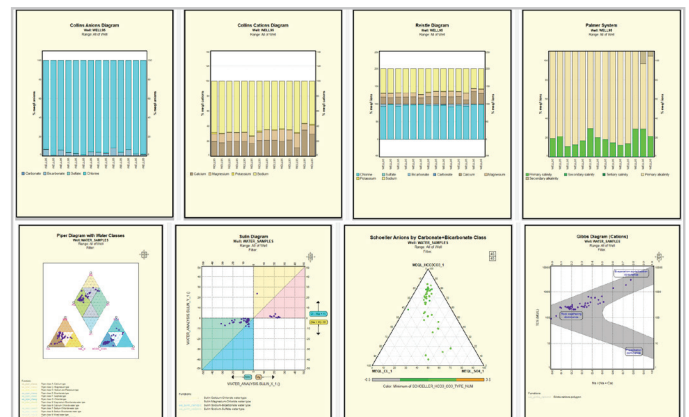*Principal Geoscientist, Eavor Technologies*

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Figure 2. Water analysis graphic plots in Geolog help define the origin of the water, physical properties and tendency to precipitate.

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