Permedia® CO₂ Software

OVERVIEW

Carbon capture and storage is increasingly becoming a factor in the E&P regulatory environment. Companies need to prospect for storage sites, and then evaluate both the short-term risks and long-term fate of stored CO₂. Permedia® CO₂ software includes an industry-validated suite of tools customized for CO₂ applications, with workflows for both prospecting and injection and storage simulation. Whether modeling in complex fractured reservoirs (e.g., In Salah), highly heterogeneous storage sites (e.g., Sleipner), or on truly regional scales while honoring high resolution data (e.g., Weyburn), Permedia CO₂ software provides the best matches to observations, insights on storage site behavior, and helpful predictions of risk profile.

BENEFITS

Workflows Customized for CO₂
Simulators typically applied to CO₂ applications are general purpose reservoir simulators requiring elaborate setup. Permedia CO₂ software couples robust reservoir, CO₂ migration and customized black oil simulators with an easy-to-use interface. These are integrated through a single wizard to help users set up simulation parameters and runs with easy-to-follow workflows.

Validated Against Major Sites
Permedia CO₂ software has been tested on the most well-known storage sites and best data sets available in the world today (e.g., Sleipner, In Salah, and Weyburn, as well as others).

KEY BENEFITS

» Workflows customized for CO₂ applications
» Validated against the most well-known storage sites and best data sets available
» End-to-end CO₂ workflow; prospecting, regional pressure modeling, plume modeling, and injection modeling
» Co-render and analyze data from multiple packages and across all length scales

KEY FEATURES

» Integrated suite of high-resolution modeling tools for CO₂ storage exploration, monitoring and prediction
» OpenWorks®, DecisionSpace® Geosciences and Neftex® Insights connectivity

Figure 1: CO₂ injection simulation using CO₂ BOS.

“The Permedia® CO₂ Toolkit and related software is a professional-grade comprehensive application for addressing all aspects of CO₂ work in the subsurface, including enhanced oil recovery and saline storage. From characterizing prospective resources, to interactive PVT, and multiphase flow simulation – Permedia is a fit-to-purpose resource that should be of great value to diverse practitioners.”

DR. TIP MECKEL, GULF COAST CARBON CENTER, THE UNIVERSITY OF TEXAS AT AUSTIN
FEATURES

Permedia CO₂ software is an integrated suite of high-resolution modeling tools for CO₂ storage exploration, monitoring and prediction. The software addresses key aspects of CO₂ storage workflows: formation storage prospecting, capacity estimation, well injectivity, formation pressurization, plume trapping, and dissolved CO₂ dispersal.

Use Permedia CO₂ software to:

» Understand the origins of CO₂ in a petroleum system
» Prospect for new storage sites
» Match storage monitoring data
» Predict the long-term fate and risks of a storage site in the post-operational phase

CO₂ Migration

A CO₂-adapted invasion percolation simulator for free-phase plume modeling. CO₂ Migration is built on the state-of-the-art Permedia Migration simulator, providing extremely high-resolution models of gravity-segregated plume distributions in heterogeneous reservoir settings.

CO₂ BOS

CO₂ BOS is a fast multi-threaded black oil simulator, developed to specifically handle CO₂ storage and solubility. Specially adapted for two-phase plume and brine modeling, CO₂ BOS is built on the Permedia Black Oil Simulator and addresses reservoir engineering workflows for CO₂ modeling in storage site settings. Specifically tuned to run CO₂ injection out-of-the-box, CO₂ BOS is fast, with built-in CO₂ injection scheduling, PVT, and solubility handling.

CO₂ Flow

CO₂ Flow is a high-resolution hydrodynamic solver for modeling CO₂ storage related pressure changes. With a well modeling scheme that handles CO₂ injection rates and injection interval pressures, CO₂ Flow offers a high-resolution regional simulation for testing the boundary conditions of high-resolution heterogeneous meshes for regional pressure models.

CO₂ Dashboard

CO₂ Dashboard is a CO₂-specific equation-of-state and PVT wizard for initializing simulations. Use CO₂ Dashboard to initialize model conditions: gas and brine phase density, compressibility, viscosity, solubility and interfacial tension. The wizard has been validated against several published works containing both theoretical and experimental data. Initial model conditions for these key properties can be automatically transferred from the Dashboard to the CO₂ simulators.

SYSTEM AND SOFTWARE

Operating System

» Red Hat® Enterprise Linux® 6/7, 64 bit
» Microsoft® Windows® 7 or later, 64 bit
» Microsoft® Windows® XP/Vista/7, 64 bit

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