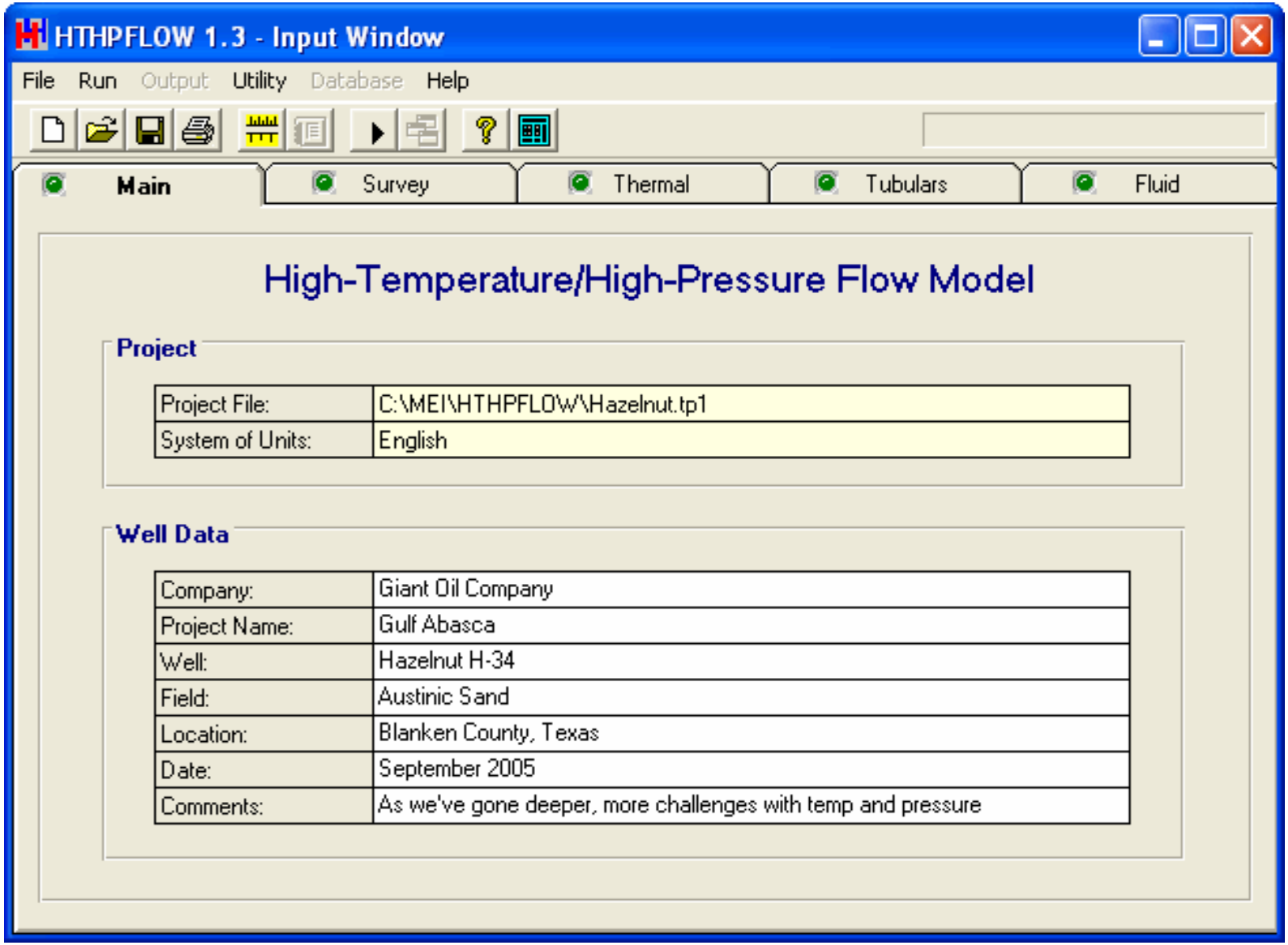
HTHPFLOW – High-Temperature/ High-Pressure Flow Model

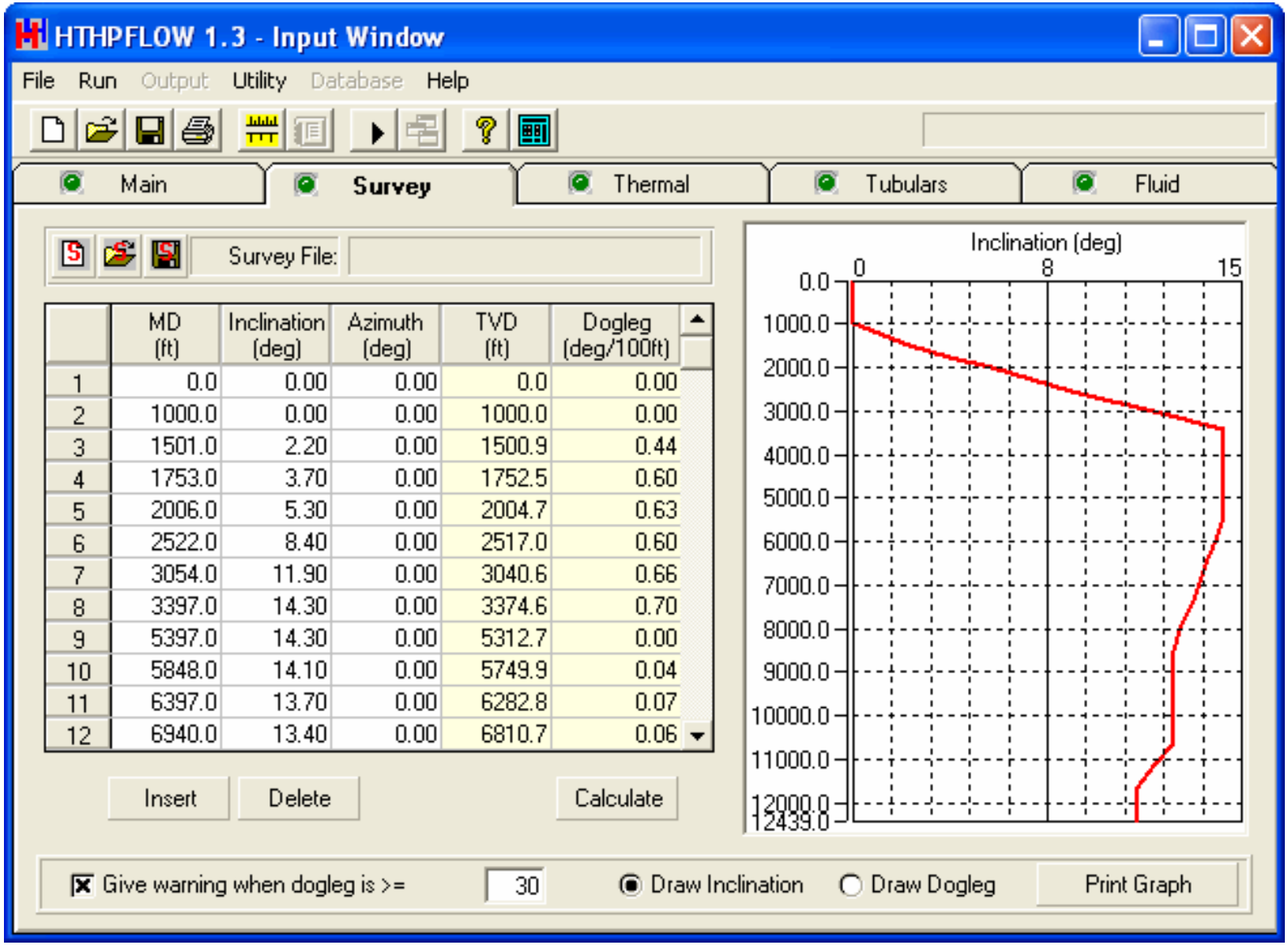
HTHPFLOW was developed by MTI to address the industry's need for detailed analysis of wellbore hydraulics and improved drilling operations for high-temperature/high-pressure wells. The program calculates pressure profiles and frictional pressure losses along the mud circulating path, and mud rheological parameters inside and outside the drill string. Output screens also compare corrected values with uncorrected values to illustrate the magnitude of the effects of temperature and pressure.

NOTE: Computer screens within this PDF document may appear slightly distorted. This is due to limitations in the Adobe Acrobat Viewer when displaying graphics. To clearly view details in the graphics, zoom in or print the document.

PETRIS



HTHPFLOW is a user-friendly package with a variety of powerful features. Design and navigation around the program is very logical. The first input screen, the Main page, stores documentation to identify specific clients, wells, fields, etc.



The Survey page is for entering the wellbore survey that describes the well trajectory. Data may be entered manually, imported, exported, or copied from a spreadsheet.

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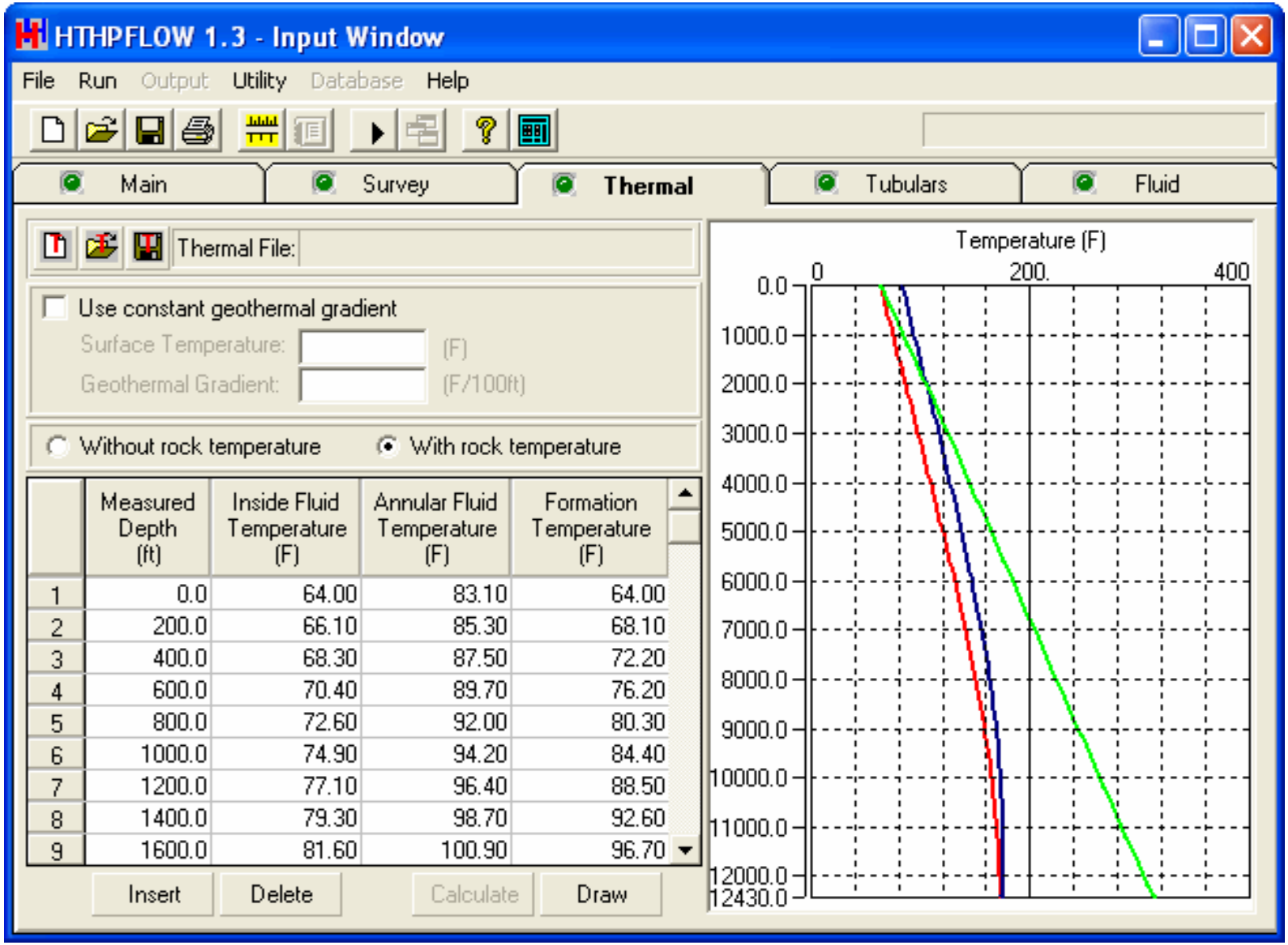

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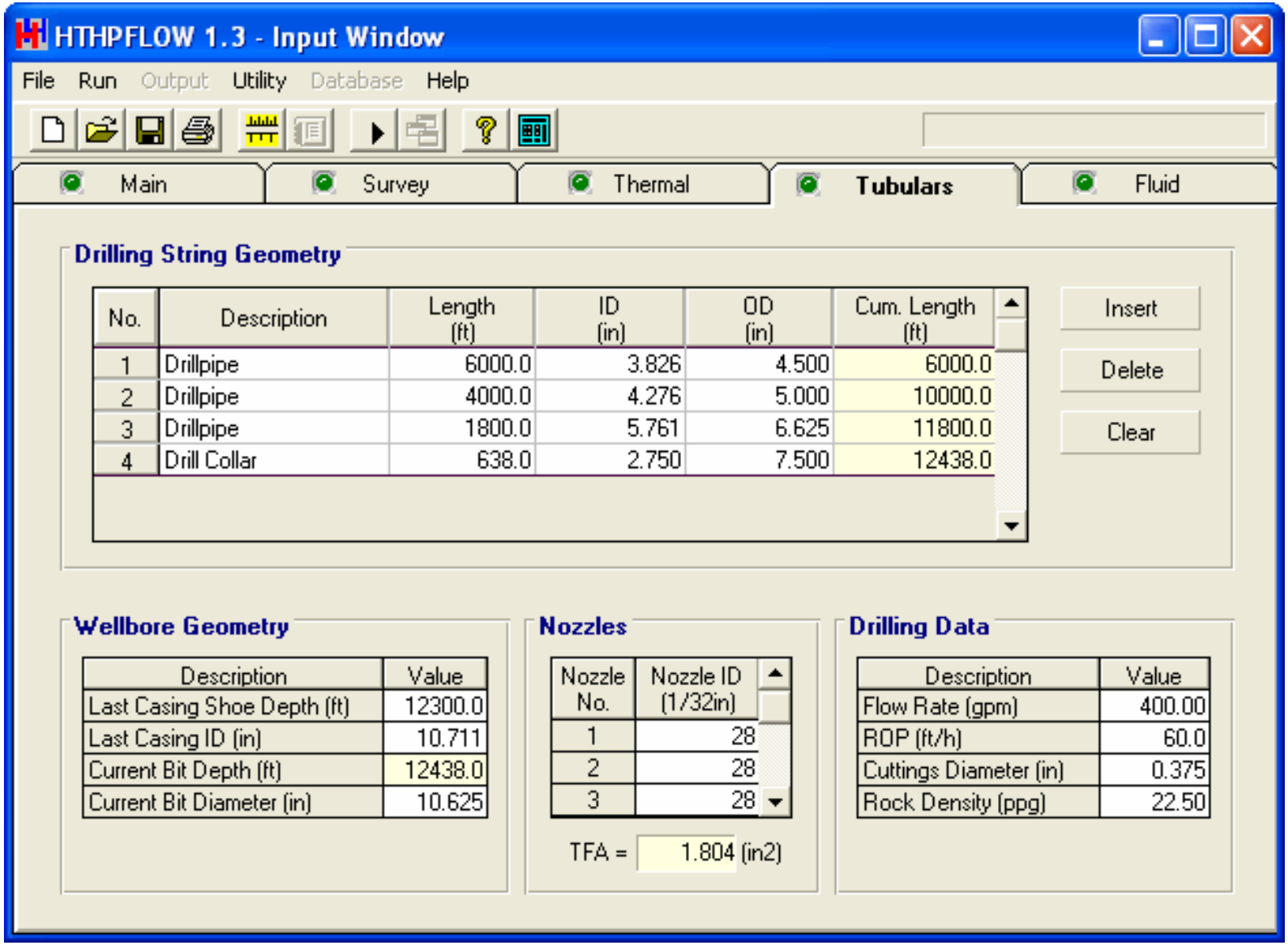
The Thermal page is used to input formation and fluid temperatures with depth for correcting fluid rheology. Temperature data can be entered into **HTHPFLOW** manually or imported from MTI's thermal simulation program **GTEMP**.



Drillstring components and wellbore geometry are specified on the Tubulars page. Enter specific sizes for bit nozzles or total flow area (TFA) through the bit.

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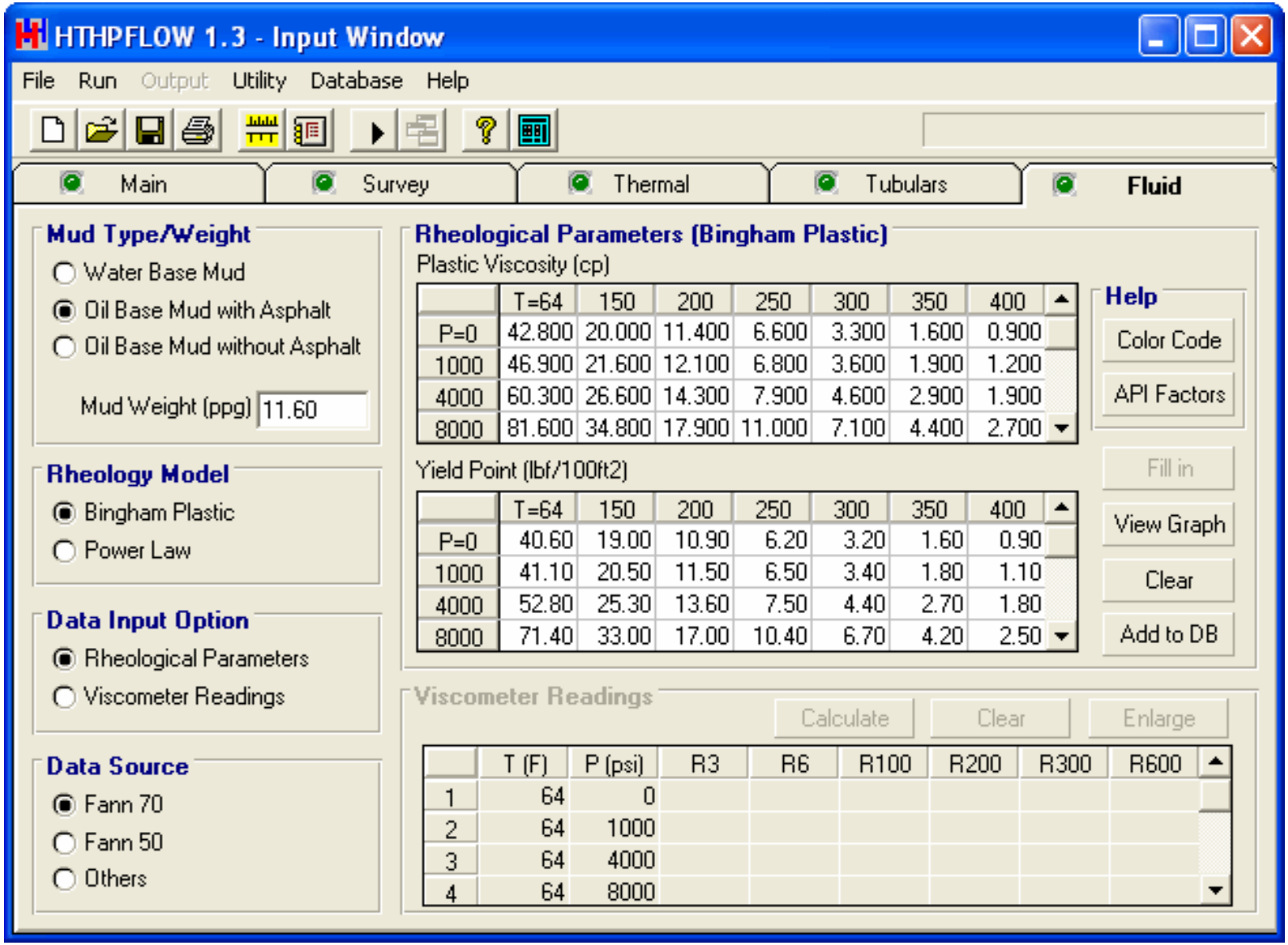

The Fluid page provides options for different mud types, rheology models, data options, and data sources. To calculate drilling hydraulics accurately, **HTHPFLOW** takes into account variation in rheological parameters with temperature and pressure instead of assuming that they are constant.

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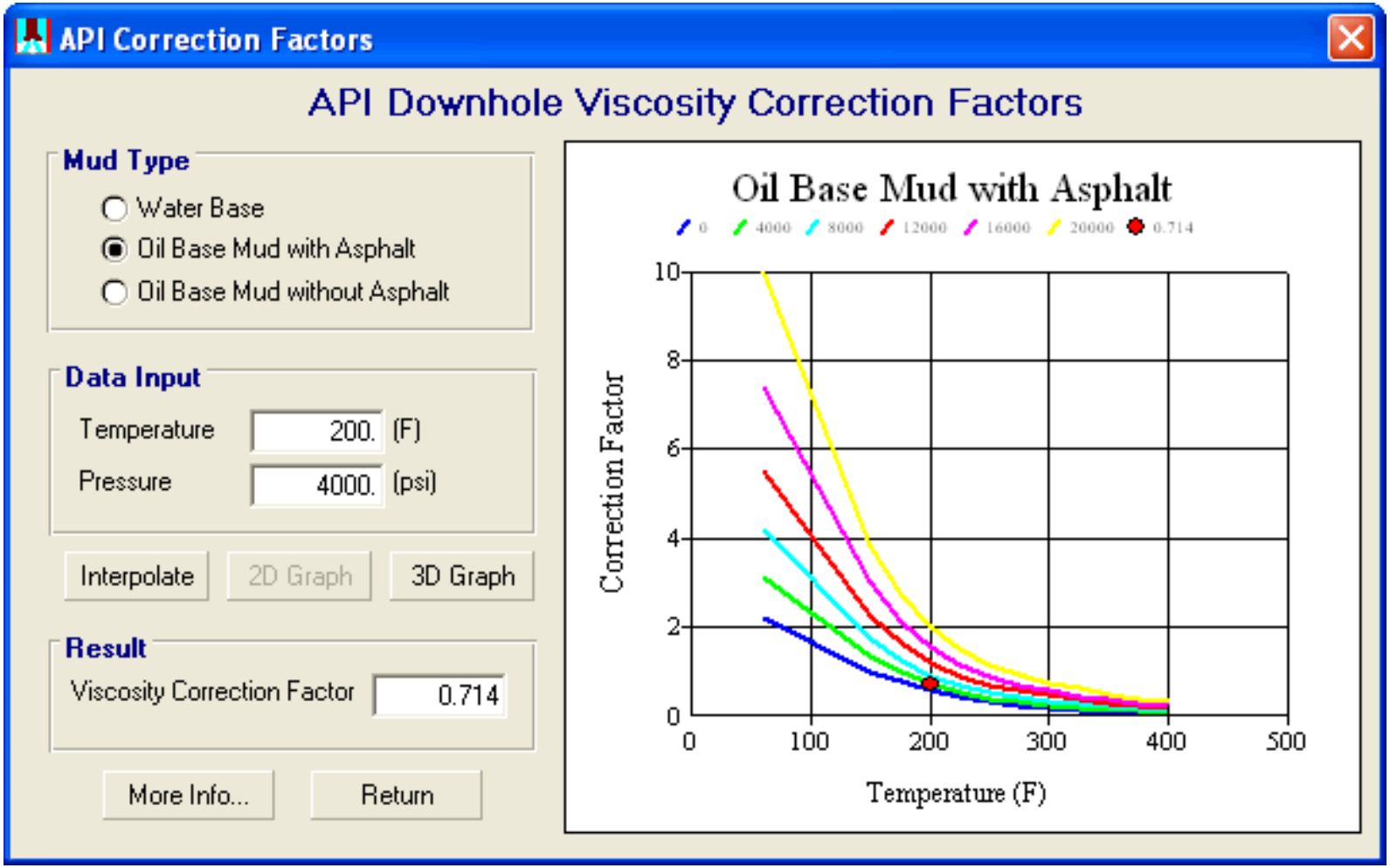

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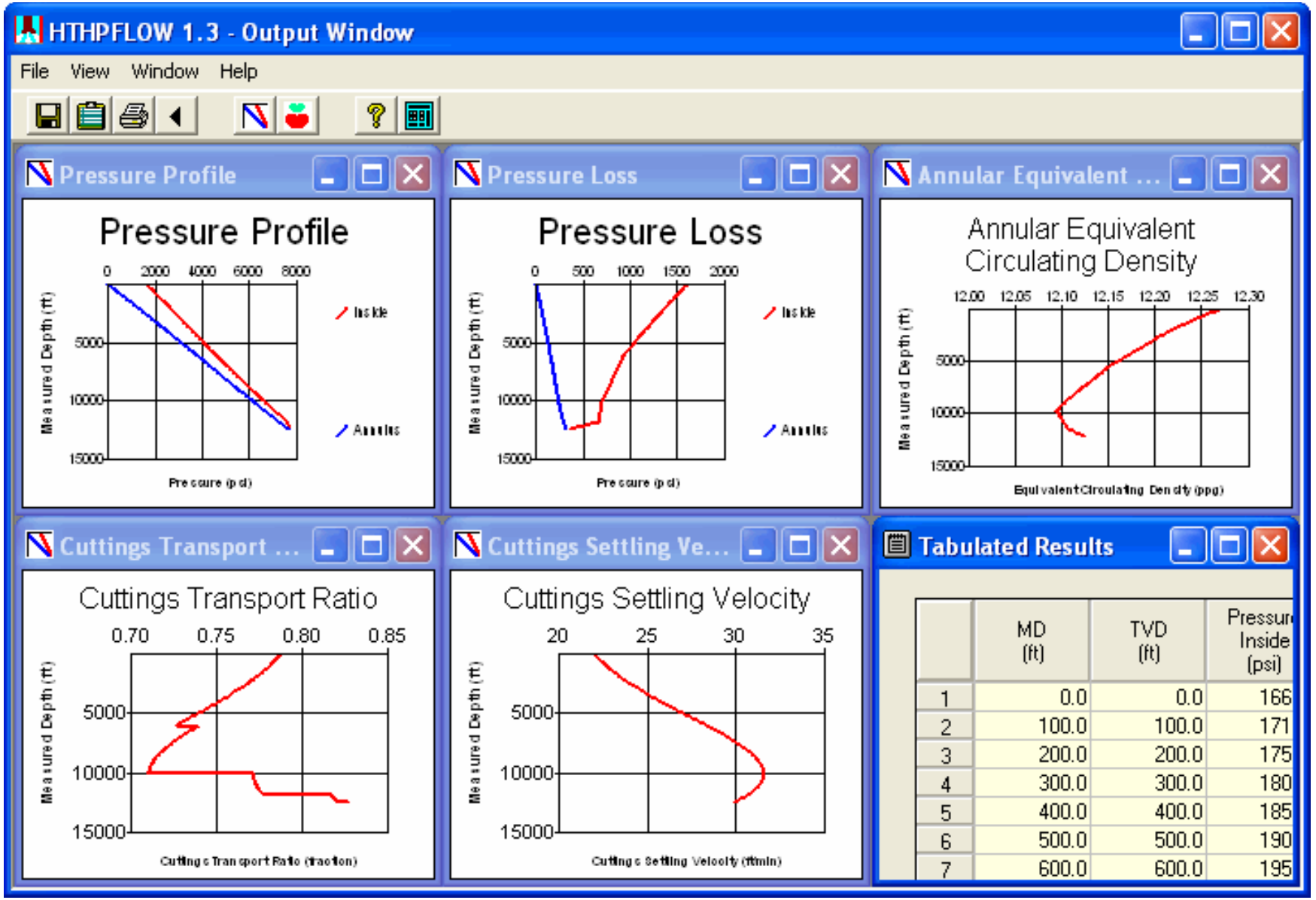
For calculating hydraulics of HTHP wells, viscosity of the drilling fluid should be determined at downhole conditions. However, if downhole properties are not known, corrections can be made based on surface conditions. API Correction Factors (average viscosity ratios obtained from measurements with a variety of drilling fluids) are easy to apply.



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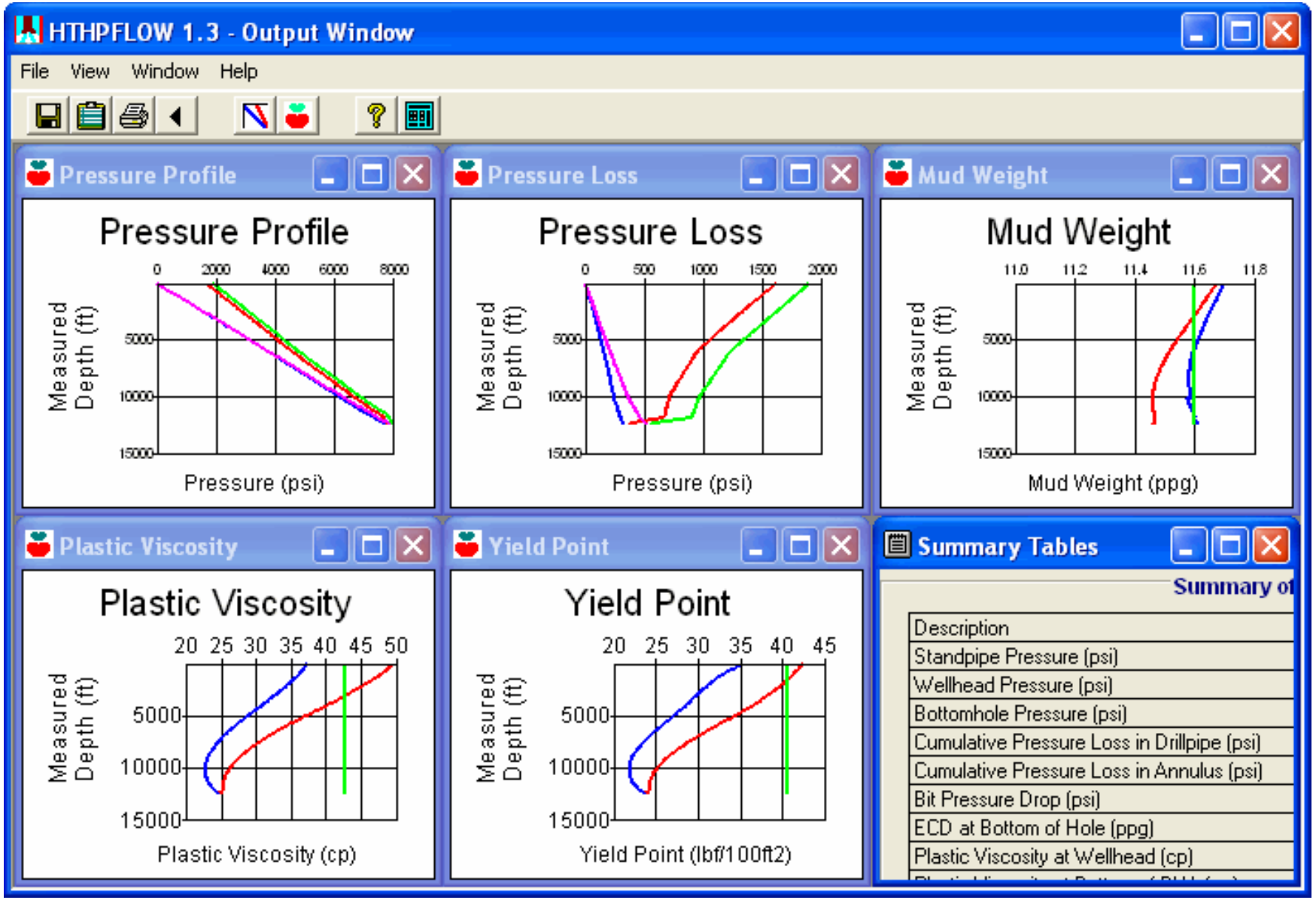
After all required input data are ready, you can immediately view the Output window. A variety of hydraulics output parameters and formats are available for review and comparison.



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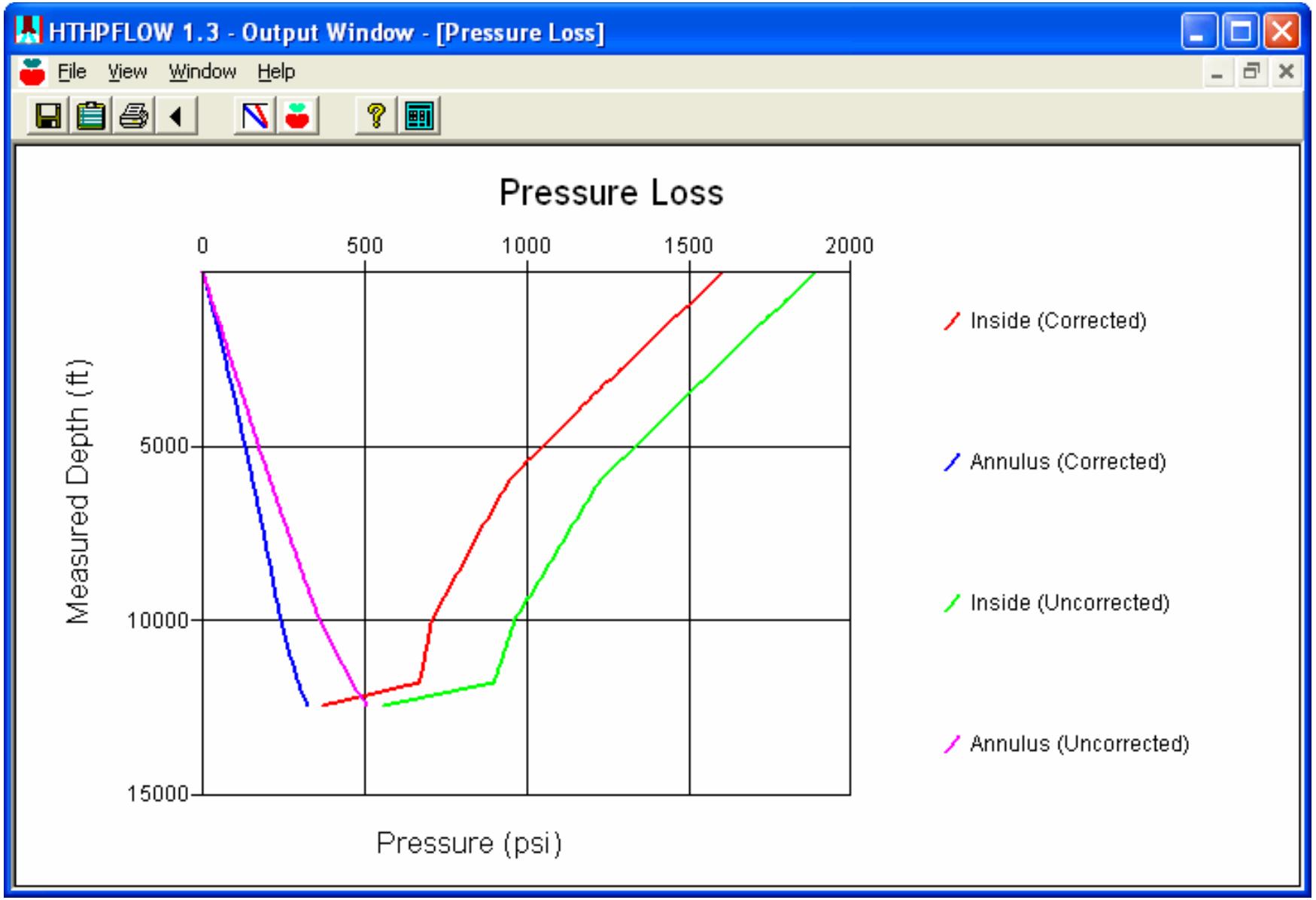
A second set of output graphs and tables is accessed by selecting the Compare window. These graphs compare the uncorrected (constant) rheology to the corrected (temperature- and pressure-dependent) rheology.



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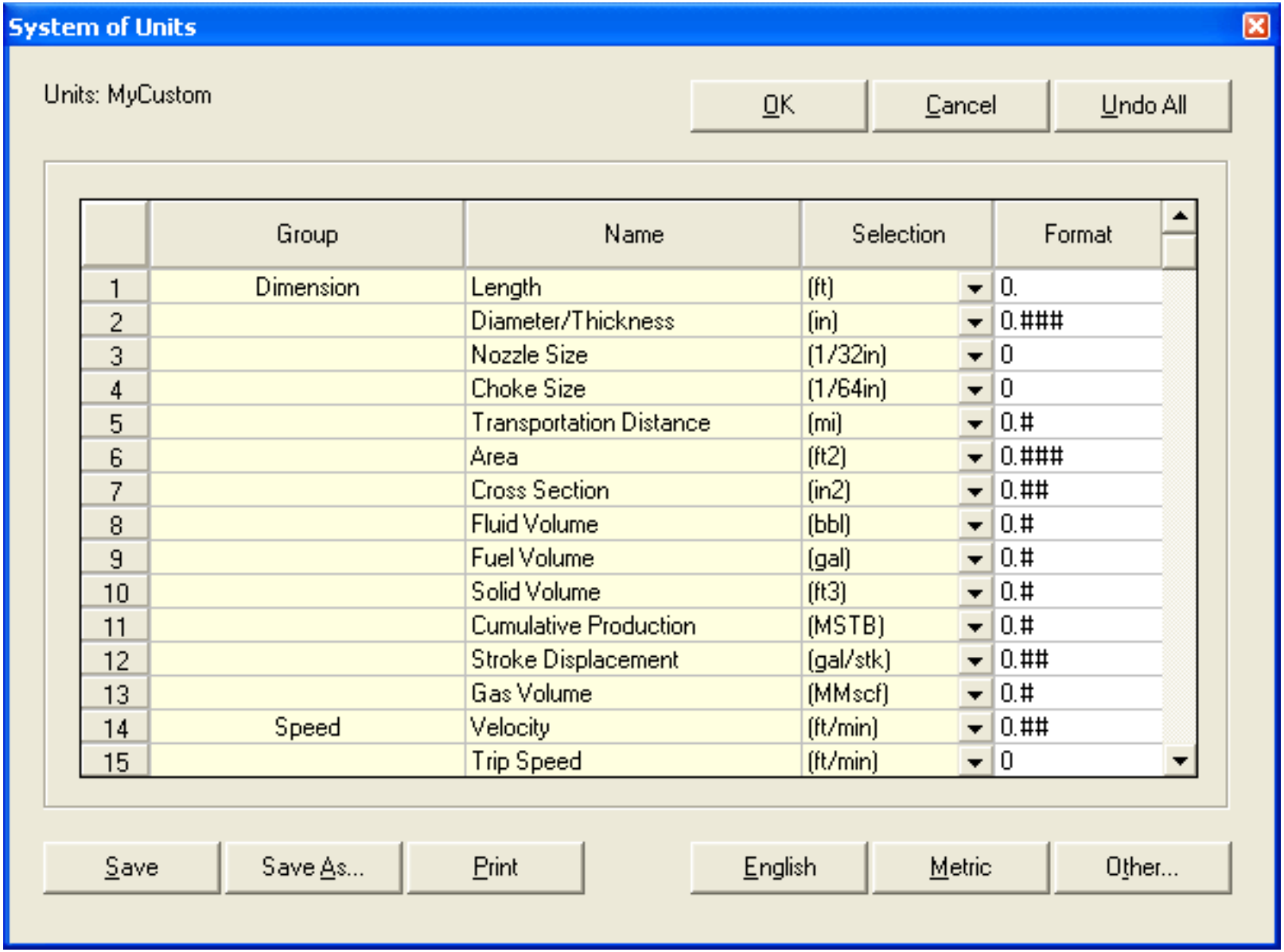
For example, the Pressure Profile graph charts pressure drop down the drillstring, across the BHA, and up the annulus with and without temperature/pressure corrections.



Units for input and output displays are easy to select and customize. Choose between the default metric or English systems, or a custom combination of units (for example, depth in meters, hole size in inches). Custom systems are saved and automatically recalled in future sessions.

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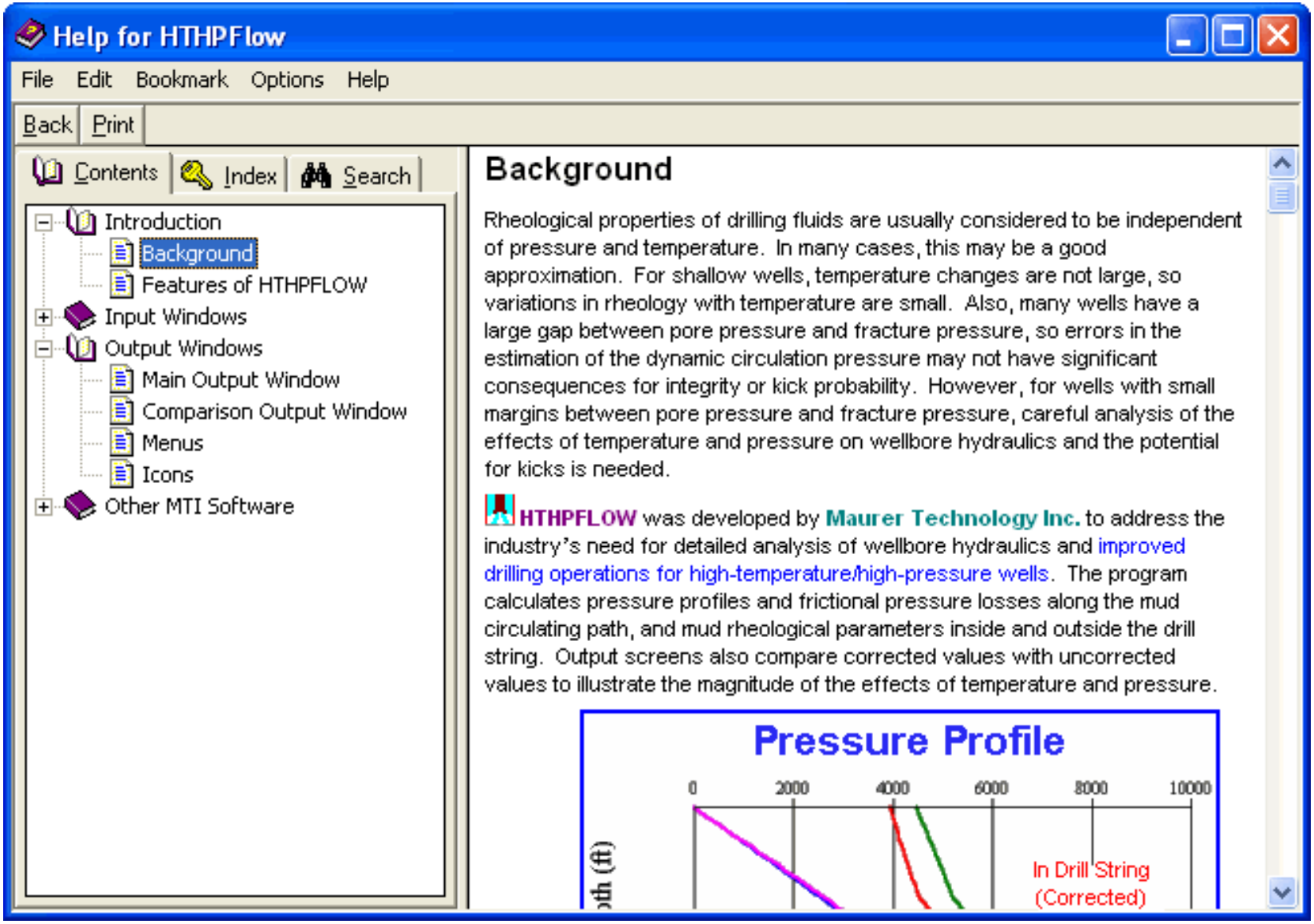

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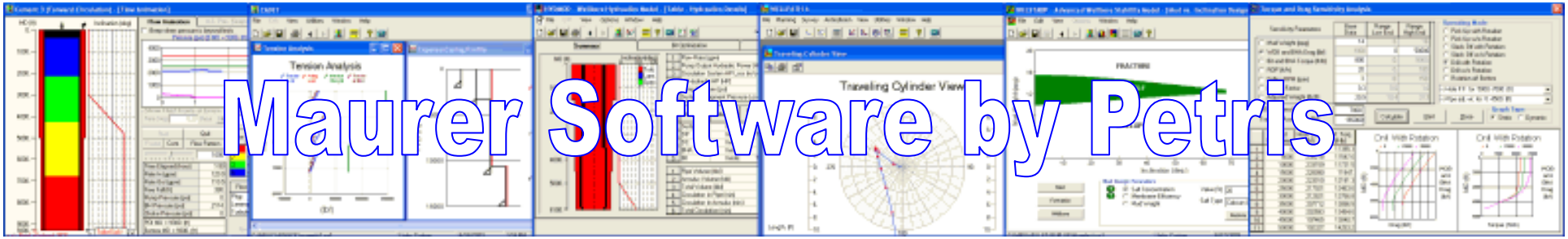
A comprehensive On-Line Help System is also provided. Tips on program operation, program structure, and basic theoretical background are immediately available at the click of a button.



Thanks for your interest in

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