Welcome to Discovery 5000.0.0.0

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WELCOME TO Discovery 5000.0.0.0!

This new release of our integrated suite of G & G interpretation tools includes numerous exciting new features and enhancements.

Important information regarding system requirements, installation, new improvements, and valuable resources that will allow you to get the most out of the Discovery™ 5000.0.0.0 release is included in this volume.

Note: If working in a network environment, in order for all computers to work together on shared projects, ALL computers (clients and servers) must be updated to the same version of the software. It is intentional that computers with different versions of GeoGraphix software can not and should not be connected with each other.

The Discovery 5000.0.0.0 release contains the following products:

GeoGraphix® Discovery™ 5000.0.0.0 is our integrated product suite that incorporates shared data management and geological, petrophysical, and geophysical interpretation tools. It utilizes a Sybase (GXDB) database in *Discovery* mode, or accesses the OpenWorks/SeisWorks (Oracle) database in *Discovery on OpenWorks* mode. The *Discovery* tools consist of the following:

Geological Suite

DataManager™ (includes ProjectExplorer™, Coordinate System Manager™, WellBase™, SeisBase™, QueryBuilder™, LandNet™, LeaseMap™, and ZoneManager™.

- The GeoGraphix *Discovery and Discovery on OpenWorks* project and data management engine

GeoAtlas™

- The map display and montage environment working on ESRI MapObjects

IsoMap®

- The gridding contouring engine, featuring 10 powerful gridding algorithms

XSection™

- A fully integrated geological interpretation tool

PRIZM™

- An interactive petrophysical and log analysis system

smartSECTION® with Discovery FrameBuilder™

- The next generation cross section and mapping tool for complex structural and sequence stratigraphic analysis.

Geophysical Suite

SeisVision™

- The SeisVision comprehensive 2D/3D seismic interpretation system, which also includes a dynamic real-time link to SeisWorks/OpenWorks™

pStaX™

- The post stack processing module for enhancing seismic character and detecting anomalies related to geologic features

SCAN™

- The patented semblance calculation for enhanced fault interpretation

Seismic Modeling

LogM Advanced Synthetics™

- The Geophysical application used for interactively editing well logs and evaluating synthetic trace character response

LogM Modeling™

- The 2D forward seismic waveform, ray tracing and structural modeling tool to predict seismic response away from the well

STRUCT™ Model Entry

- The comprehensive forward seismic structural modeling tool that is used to determine the seismic response of complex geologic structures in areas where there is little or no well control

Landmark Connectivity

Discovery™ on OpenWorks®

- Enables the *Discovery* tools to access OpenWorks and SeisWorks projects, and uses the OpenWorks and SeisWorks data within the *Discovery* framework

Xchange Tools

WellXchange™

- Transfer well information to or from legacy GES97 products or between two Discovery projects
  Note: WellXchange does not transfer data in or out of OpenWorks in this release of Discovery.

SeisXchange™

- Transfer seismic data between SeisVision and SeisWorks

GridXchange

- Transfer of map point sets and grids from *Discovery* to OpenWorks

Note: SeisBase, LandNet, LeaseMap, WellXchange, LogM ModelBuilder (LogM Modeling), and LogM Well Editor (LogM Advanced Synthetics) are not available in the current version of Discovery on OpenWorks.

System Requirements

On the following pages, you will find hardware and software system requirements tables for this release of *Discovery* and *Discovery on OpenWorks*:

- ***Discovery* Workstation**
- ***Discovery* Project Server**

System requirements can vary considerably, depending on your computing environment and software objectives. Please contact your Sales Representative or Customer Support if you have questions or need more information about system requirements.

Important Notes:

- **Clients using *Discovery on OpenWorks* must upgrade to OpenWorks 5000.0.0.3 and SeisWorks 5000.0.0.2**
- **Please also refer to the GeoGraphix Customer Support Portal (http://css.lgc.com/CustomerSupport/CustomerSupportHome.jsp) for up-to-date information on system requirements for all GeoGraphix products.**

Discovery **Workstation**

Operating System Requirements		
Supported Operating System	**RAM**	**CPU**
Windows® XP Professional 32 bit SP3	2 GB Minimum 4 GB Recommended	Pentium 4 class or better Dual processors/cores
Windows® XP Professional 64 bit SP2	2 GB Minimum 4 GB recommended	Pentium 4 x 64 class or better Dual processors/cores
Windows® Vista Business 32 bit SP1 Or Windows® Vista Enterprise 32 bit SP1 Or Windows® Vista Ultimate 32 bit SP1	2 GB Minimum 4 GB recommended	Pentium 4 class or better Dual processors/cores
Notes		
Note 1 – Discovery on OpenWorks is not yet supported on Vista. Note 2 – Discovery is not yet supported on Vista 64 bit platforms. Note 3 – Discovery runs in 32 bit compatibility mode on 64 bit platforms. Note 4 – Current service pack versions are listed. We recommend using the latest Mcrosoft service packs and security patches. Note 5 – Actual available RAM on 32 bit platforms will generally be less than 4 GB due to OS limitations.		

Additional Requirements and Recommendations

- DVD-ROM required for media install. Download install available through Landmark Software Manager (LSM)
- DCOM configured to allow remote access. Only necessary if sharing projects
- Microsoft .NET 3.5 runtime required
- OS supported dual monitor capable video card and display at 1024x768 16k colors or better

Discovery Workstation (continued)

Optional Software Requirements	
For spreadsheet import utility in WellBase, SeisBase, and LeaseMap	Excel 2003 or 2007
For Selected Help files	Adobe reader
For Discovery on OpenWorks, GridXchange, SeisXchange	OpenWorks for Windows 5000.0.0.3 – Basic or Full (recommended) Install available on LSM. (See Notes below) and SeisWorks 5000.0.0.2 (for seismic workflows)
For ESRI georeferenced images and ESRI CAD file import in GeoAtlas	ESRI arcGIS Runtime Engine 9.2 (on Discovery DVD or download from LSM – Discovery Utilities)
For LOGarc™ Version 3.2.1.00 access in smartSECTION	To use the LOGarc™ feature the LOGarc™ Version 3.2.1.00 software must be downloaded from LogTech Canada, LTD and a valid account must be in place. You must have administrator rights to the computer you will load the software to.
For TracPlanner Xpress in Discovery	WellPlannimg for Discovery 5000.0.1.0 (contained within the DecisionSpace 5000.0.2.0 install, which is available on the LSM). Oracle Express Client or Oracle 10g Client 10.2.0.3 (32 bit) *Note: TracPlanner Xpress is not supported on Windows® Vista operating systems.* *Note: TracPlanner Xpress will only work on Windows® XP 64 bit operating systems if you use the DecisionSpace 32 bit install and Oracle 32 bit client install.*

The OpenWorks Full install requires Hummingbird Exceed. The Oracle client installation in use with the OpenWorks Full installation requires that the “Administrator” option be selected. The “Administrator” option type includes the SQL Plus and the Oracle Database Utilities components, which are needed to run Discovery on OpenWorks, as part of the total OpenWorks package.

Hummingbird Exceed is not required for the OpenWorks Basic install. If OpenWorks Basic installation is used, the Oracle client installation can use the “Administrator” option, which will include all of the needed components. Or, the Oracle client installation for the OpenWorks Basic installation can use the “Custom” installation type. However, with this install type the Oracle Database Utilities 10.2.1.0, SQL *Plus 10.2.1.0, Oracle JDBC/THIN Interfaces 10.2.1.0 and Oracle Net 10.2.1.0 components must also be selected for installation

Discovery **Project Server**

Operating System Requirements		
Supported Operating System	**RAM**	**CPU**
Windows® Server 2003 Standard 32 bit	2 GB Minimum 4 GB Recommended	Pentium 4 class or better Multiple (2-4) processors/cores
Windows® Server 2003 Enterprise 32 bit	2 GB Minimum 6-16 GB Recommended	Pentium 4x64 class or better Multiple (2-4) processors/cores
Windows® Server 2003 Standard 64 bit Or Windows® Server 2003 enterprise 64 bit	2 GB Minimum 8-16 GB Recommended	Pentium 4x64 class or better Multiple (2-4) processors/cores
Notes		
Note 1 – Memory recommendations beyond 4 GB are only beneficial when running a large (>2 GB) cache sizes for the database engine. Note 2 – Client applications (e.g. WellBase) are not supported on server OS versions. Note 3 – Discovery runs in 32 bit compatibility mode on 64 bit platforms. Note 4 – Current service pack versions are listed. We recommend using the latest Microsoft service packs and security patches.		

Additional Requirements and Recommendations

- DVD-Rom required for media install. Download install available.
- DCOM configured to allow remote access

Server performance is subject to a large number of variables. It is impossible to give specific recommendations here, but these are some guiding principals to use. In general, multi-user performance of a GeoGraphix project server is best when the server is dedicated to GeoGraphix and not shared with other applications, especially database applications. In addition, consideration should be made for the number of GeoGraphix users and the size and number of concurrently accessed projects. At some point having multiple project servers becomes a better solution than having all users on one server. Generally, somewhere between 10 and 20 users is when a second server might be suggested.

Discovery Project Server (continued)

Networking

Networking performance depends on the number of users trying to access a server simultaneously as well as the bandwidth requirements for those users. Recommendations for server bandwidth typically specify server connectivity at a higher bandwidth than an individual user. For instance, users running at 100 Mbit should be accessing a server running on a 1 Gbit backbone. If users are at 1 Gbit, consider running multiple 1 Gbit connections on the server.

Database Cache

A large database cache is an important factor to consider when dealing with multiple users accessing large databases. A cache size of up to 1.8 GB is available using basic database startup settings. Larger cache sizes are available but these require special configuration.

Storage

A great deal of Discovery's access patterns on a server deal with file I/O. Database access, raster images and seismic data are examples of files that benefit substantially from a fast disk sub-system. Server environments also place a high importance on data integrity and reliability. At a minimum, consider using a RAID 5 (striped with parity) array. As the size of disks increase, you may also want to consider a hot swap drive and/or RAID 6 (striped with dual parity). Using a controller card with its own cache can also help improve performance.

Network Attached Storage (NAS), Storage Area Networks (SAN), and Other Non-Windows Storage Solutions

There are two typical methods used for accessing external storage devices from a project server; iSCSI and CIFS.

- iSCSI allocates a block of storage on the external device and makes it appear to be a physical disk on the project server. This has the advantage of a 100% compliant file system. However since the external device sees the allocation as one big file, it makes backup and restore of individual files using the external device's capabilities problematic. Standard backup and restore from the server still work.

- Using CIFS for external storage devices depends greatly on the vendor’s implementation of the CIFS protocol used by the Windows platform. In general, a 100% compliant implementation of CIFS for a perfomant system is required. In particular, vendor's implementation of the "File Change/Notify" functionality has been problematic. Devices based on Windows Storage Server should be 100% compatible since it shares its components with Windows. Implementations based on UNIX/Linux are where problems occur due to the fact that the kernel level support is not there.

Installation

The following instructions will begin the installation process. The Discovery 5000.0.0.0 Installation Guide can be accessed in Step 4 below, which will assist you in the remainder of the install.

Please read this entire document prior to performing installations.

Important Notes:

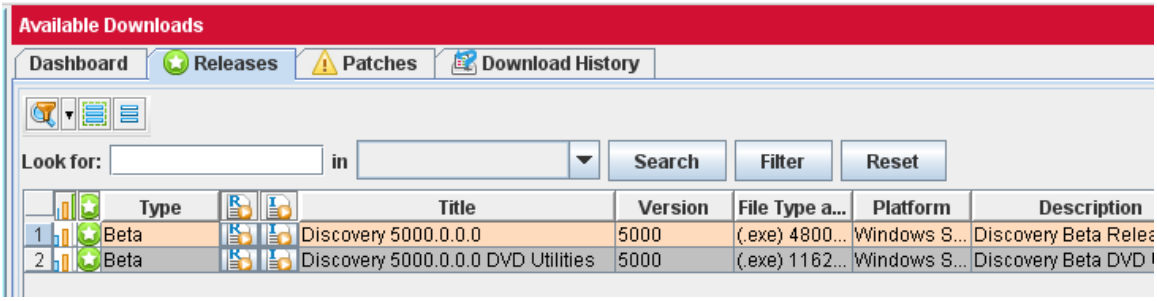
- You must have **Administrative Rights** to the local computer that will run the install.
- Must have **Internet Explorer 6.0** or higher installed.
- Must have networking installed including the **TCP/IP** protocol.
- This software should only be installed on **Windows ® XP Professional 32 bit SP3, Windows ® XP Professional 64 bit SP2, Windows ® Vista Business 32 bit SP1, Windows ® Vista Enterprise 32 bit SP1, Windows ® Vista Ultimate 32 bit, Windows ®Server2003 Standard 32 bit, Windows ®Server2003 Enterprise 32 bit, Windows ® Server 2003 Standard 64 bit,** or **Windows ® Server 2003 Enterprise 64 bit** operating systems.
- Discovery on OpenWorks is not yet supported on **Windows® Vista** operating systems.

You can download the Discovery 5000.0.0.0 software from the Landmark Software Manager (LSM), or, on request a DVD will be sent to you.

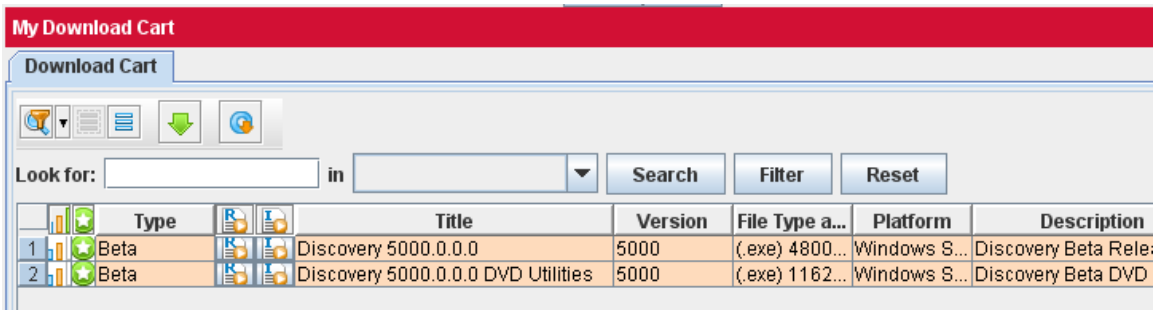
Discovery 5000.0.0.0 Landmark Software Manager Download Instructions

The following instructions will assist you in downloading the Discovery 5000.0.0.0 software from the Landmark Software Manager (LSM).

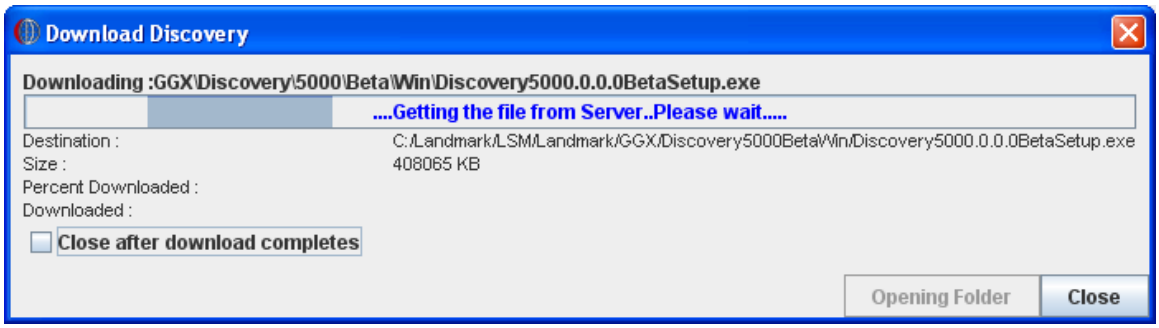
1. Within the **Available Downloads** page on the **Releases** tab of the LSM highlight the ***Discovery 5000.0.0.0*** and the ***Discovery 5000.0.0.0. Utilities*** rows. (Note: If you do not need any of the Discovery Utilities or Extras then it is not necessary to download the Discovery Utilities.)



2. Select the **Down** Arrow  to move the items down to the **My Download Cart** page on the **Download Cart** tab.



3. Highlight the download(s) and then select the **Download Now**  button.
4. Click **OK** at the **Preferences** dialog box. Note that the default download for the file(s) will be **C:\Landmark\LSM\Landmark**.
5. Click on the **AGREE** button for the **LANDMARK GRAPHICS CORPORATION BETA LICENSE AGREEMENT**.
6. Once the file(s) have been downloaded click on the **Close** button to close the **Download Discovery** progress bar. (Ignore the **Opening Folder** button.)



To install the file(s) go to the **C:\Landmark\LSM\Landmark\GGX\Discovery5000Win** folder and double click on the **Discovery5000.0.0.0Setup.exe** file to start the setup. (The install will first need to extract the setup files to the local drive.)

Installing the Discovery 5000.0.0.0 Software

When you are ready to install the **Discovery 5000.0.0.0** software, make sure no other Windows applications are running.

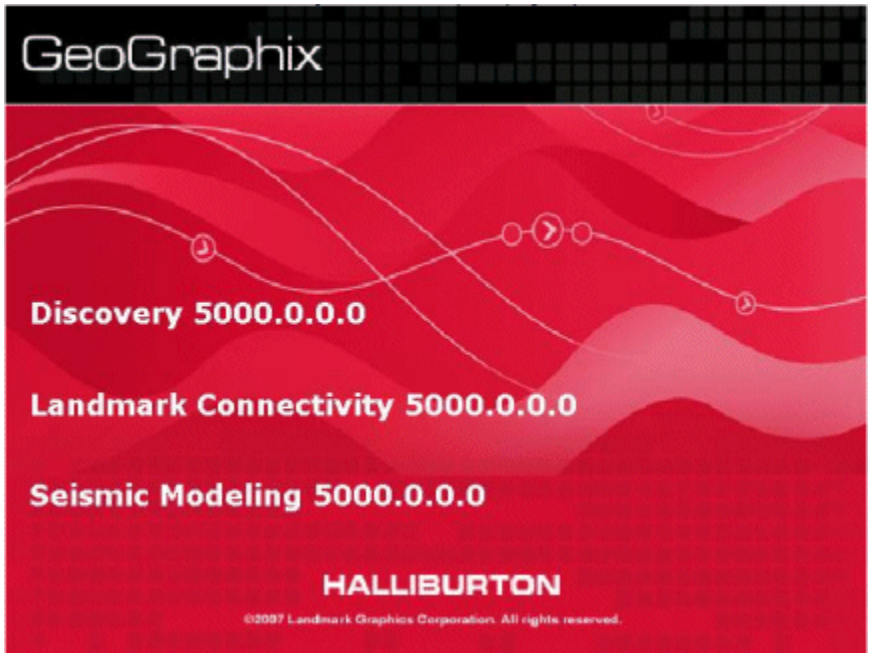
Select from either Step 1 or Step 2 below, then follow the instructions to install the **Discovery 5000.0.0.0** software.

1. If you have downloaded the **Discovery 5000.0.0.0** software from LSM, go to the **C:\Landmark\LSM\Landmark\GGX\Discovery5000Win** folder and double click on the **Discovery5000.0.0.0Setup.exe** file to start the setup. (The install will first need to extract the setup files to the local drive.)

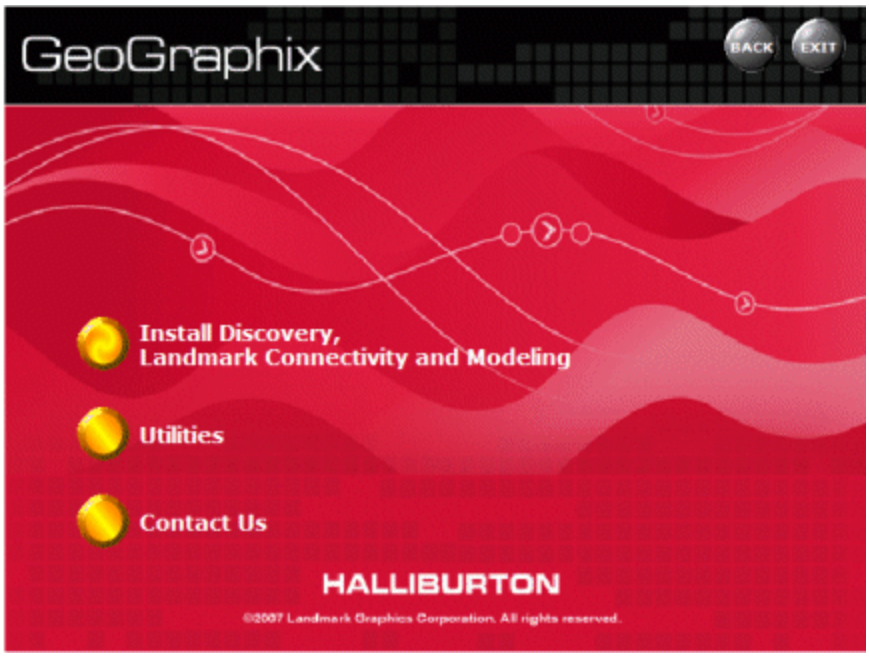
2. If you have ordered the **Discovery 5000.0.0.0 Release DVD**, place the **Discovery 5000.0.0.0 DVD** in the DVD drive of your computer. The installation routine should begin automatically from the DVD. If the installation routine does not begin or is interrupted, use Windows Explorer to navigate to the DVD drive, and launch Install.exe from the DVD.

   By using either Step 1 or Step 2 above, the **GeoGraphix splash screen** will appear for a few seconds.

   - ***Note**: If the GeoGraphix splash screen does not appear automatically, go to the Start Menu, and select Run. In the Run dialog box, browse to the appropriate DVD-ROM drive and select the Install.exe file. Click OK.*

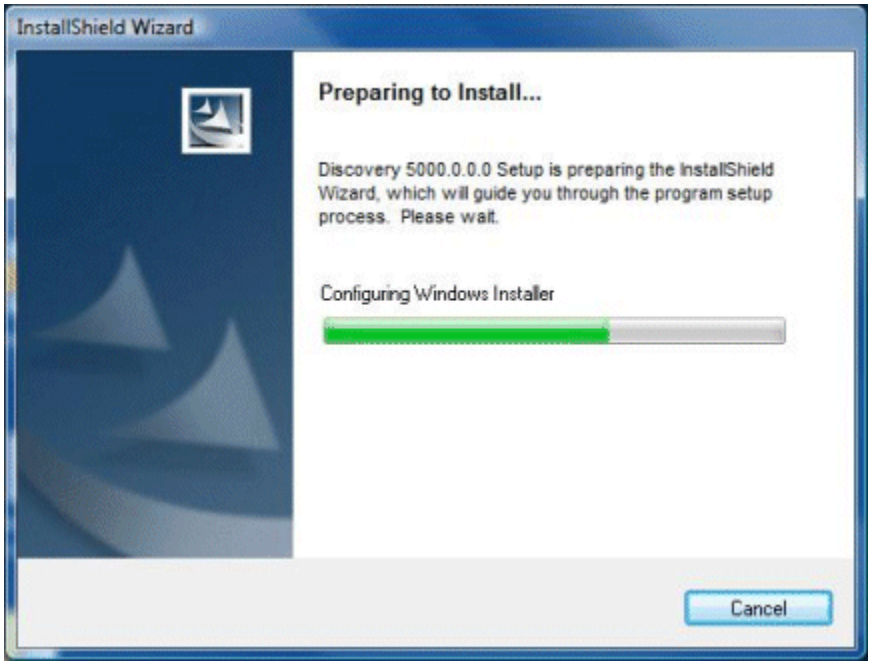


   Then the **GeoGraphix Install** window appears



3. Click the first option **Install GeoGraphix Discovery, Landmark Connectivity, and Modeling** to proceed to the next step of the End User Installation.

   The InstallShield Wizard is started, and the **Preparing to Install** dialog box is displayed while the Wizard configures the install.

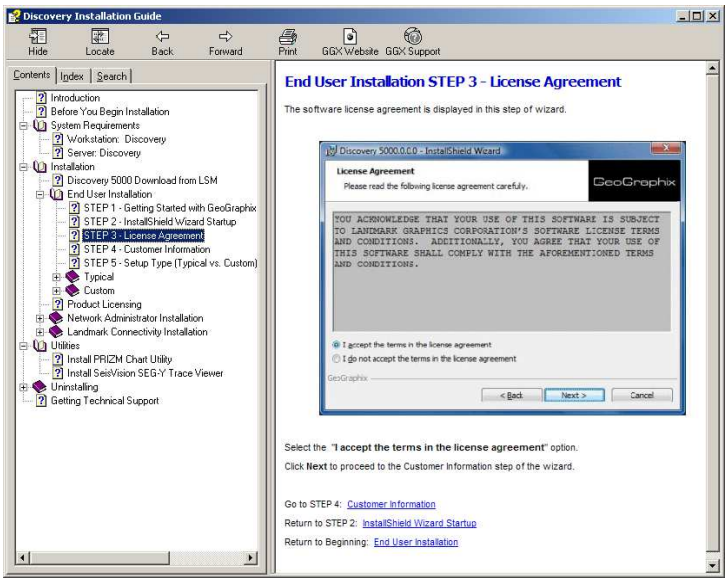


Then the **Welcome to the InstallShield Wizard for Discovery 5000.0.0.0** automatically appears.

4. Click **Help** (the Help file window will open only if Internet Explorer 6.0 or higher is installed).

    - ***Note***: *The GeoGraphix Installation Guide Help document can also be accessed directly from LSM or the Install DVD. For the LSM, click the I button on the LSM interface. For the DVD, use Windows Explorer to navigate to the DVD drive, and launch or copy the Setup Instructions.chm file from the DVD.*

5. Once the **Discovery Installation Guide** Help window opens, use the hyperlinks in the Introduction topic or select the appropriate book in the Contents tab of the Help window to find valuable information about installing Discovery 5000.0.0.0.



6. Use the **Discovery Installation Guide** Help window to assist you through the installation process. Valuable information regarding different types of installations including *End User Installation, Network Administrator Installation, Landmark Connectivity Installation*, and *Utilities*, can be found in the **Discovery Installation Guide**. If desired, clicking the **Print** button at the top of the Help window will print topics in the **Discovery Installation Guide**.

7. Carefully follow each step and in only a few minutes, you will be up and running with the **Discovery 5000.0.0.0** software.

If you have questions about the installation or usage of any Discovery 5000.0.0.0 application, you can contact GeoGraphix Customer Support via the Support Portal at **http://css.lgc.com/CustomerSupport/CustomerSupportHome.jsp**, via e-mail at **solutions@geographix.com**, or via telephone (telephone numbers are listed on the website or can be found in any GeoGraphix Help window by clicking the GGX Support button).

TracPlanner Xpress for Discovery 5000.0.0.0 Installation Information

Please read this entire document prior to performing installations.

TracPlanner Xpress for Discovery is designed to run integrated workflows between *Discovery* and *WellPlanning - Discovery* on Windows XP32 and XP64 operating systems. This functionality requires a TracPlanner Xpress for Discovery license. For the 5000 versions of the workflow, having a 32 bit Oracle client installed is a pre-requisite for running WellPlanning – Discovery.

- TracPlanner Xpress for Discovery is not enabled for Discovery on OpenWorks in the current release.
- WellPlanning - Discovery is not supported on Windows® Vista operating systems in the current release.
- To use TracPlanner Xpress for Discovery on Windows® XP 64 bit operating systems you need to use the DecisionSpace 32 bit install of WellPlanning – Discovery and an Oracle 32 bit client install.

Installation Requirements for TracPlanner Xpress with Discovery 5000.0.0.0

Either of the two following installation configurations will support running the TracPlanner Xpress for Discovery workflows from GeoAtlas.

Configuration 1:

1. Discovery 5000.0.0.0 with TracPlanner Xpress Utilities installed.
    - The TPX Utilities are a custom install option available in the Discovery install.
2. Oracle Express 32 bit Client or Oracle 10g Client 10.2.0.3 (32 bit).
3. WellPlanning - Discovery 5000.0.1.0 (32bit).
    - WellPlanning – Discovery is available as part of the DecisionSpace 5000.0.2.0 Windows 32bit installer.

Or

Configuration 2:

1. Discovery 5000.0.0.0
2. Oracle Express 32 bit Client or Oracle 10g Client 10.2.0.3 (32 bit).
3. WellPlanning - Discovery 5000.0.1.0 (32bit).
    - WellPlanning – Discovery is available as part of the DecisionSpace 5000.0.2.0 Windows 32bit installer.
4. OpenWorks for Windows 5000.0.0.3 (Basic or Full install).

What's New in Discovery 5000.0.0.0

Many changes and additions have been made in this release of *Discovery*.

Users are an integral part of our development process. User requests to focus on ease of use in simplifying G & G workflows, performance and stability have driven many of the exciting new improvements in Discovery 5000.0.0.0.

Details and illustrations of the new features and enhancements in each application are described in the following pages. The major highlights of R5000.0.0.0 are:

- **General** improvements
  - Support for XP64 (Discovery and Discovery on OpenWorks projects) and Vista (Discovery projects only) operating systems
  - Support for OpenWorks 5000.0.0.3

- **Coordinate System Manager** improvement
  - Molodenski-Baderkas Datum

- **GeoAtlas** improvements include:
  - New Criteria for Conditional Pies
  - Add New/Selected Well to Database Command
  - View Selected Well(s) in Command
  - Active Layer and Entity
  - Selection of Multiple Wells
  - ESRI ArcObject support

- **QueryBuilder** improvements include:
  - QueryBuilder Support for smartSECTION
  - New Data Fields to WellBase Queries

- **SeisVision** improvements include:
  - Using Only Displayed Seismic for Mapping
  - Selecting a Well on a 2D Seismic Line in Map View
  - Show Predefined Lines in Map View
  - Autopick Right or Left
  - Erase 2D Horizon Picks
  - Star and Fan Seismic Display Patterns

- **smartSECTION** improvements include:
  - Active Well Tab for Cross Section View
  - Select from Multiple Entities at a Location
  - Add color to Contour Surfaces
  - Seismic Backdrop for Cross Section View
  - Projected Cross Sections
  - LOGarc™ Integration
  - Missing/Restored Tops to Map surface Geometries

- **PRIZM** improvements include:
  - Show All Wells in Prizm
  - Update Interval Data Types

- **WellBase** improvements include:
  - Original Operator field added to the Information Manager
  - Mechanical Data Added to the Database
  - IHS Enerdeq Imports Improvements
  - WellHeader is Not Editable Flag
  - Re-Query Database During Bulk Update of WellBase Layers
  - Save Changes Menu Command and Bar
  - New Fields in the Formation Table to Accommodate smartSECTION

- **XSection** improvement
  - Update Interval Data Types

- **ZoneManager** improvement
  - Transfer of Data from DSS to ZoneManager

General

Support for XP64 and Vista Operating Systems

The Discovery 5000.0.0.0 software is supported on **Windows ® XP Professional 64 bit SP2,** operating systems for both Discovery and Discovery on OpenWorks projects. The Discovery 5000.0.0.0 software can also be installed on **Windows ® Vista Business 32 bit SP1, Windows ® Vista Enterprise 32 bit SP1, Windows ® Vista Ultimate 32 bit** operating systems for Discovery projects only (Vista is not yet supported for Discovery on OpenWorks).

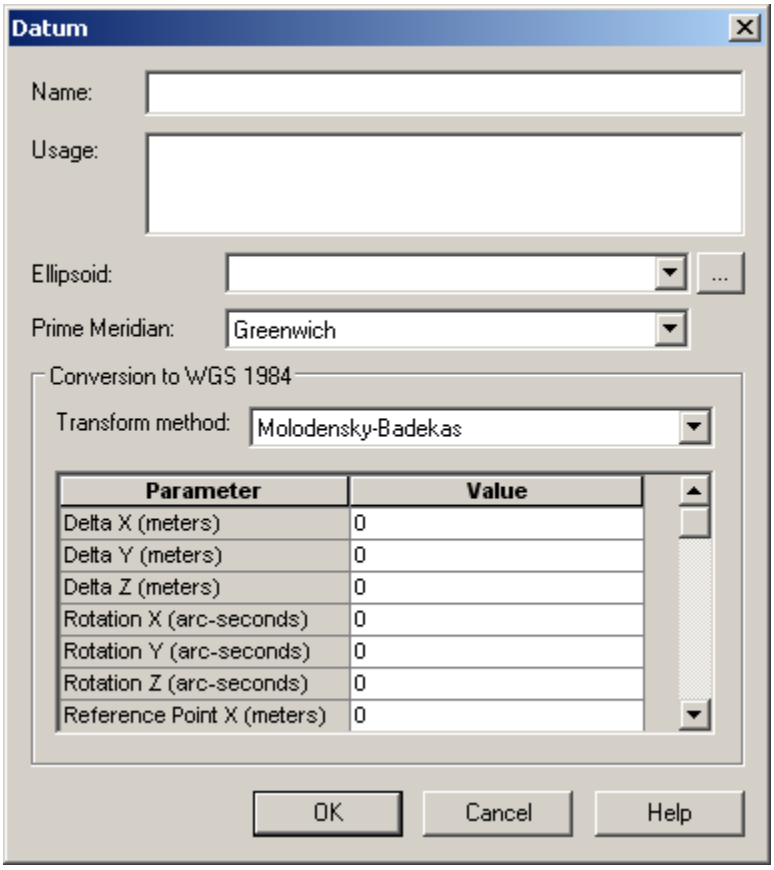
Support for OpenWorks 5000.0.0.3

The Discovery 5000.0.0.0 release offers support for OpenWorks 5000.0.0.3, the major synchronous release from Landmark Graphics. OpenWorks 5000.0.0.3 allows Discovery on OpenWorks to leverage new OpenWorks features such as Interpretation Projects and integrated data management.

Coordinate System Manager

Molodenski-Baderkas Datum

Conversion of latitude/longitude coordinates from one datum to another datum requires a transformation method. GeoGraphix uses WGS 1984 as its standard datum so when latitude/longitude coordinates need to be transformed from one datum to another datum, GeoGraphix transforms input latitude/longitude coordinates to WGS 1984 using a transformation method, then, if necessary, GeoGraphix transforms from WGS 1984 to output latitude/longitude coordinates using a transformation method.



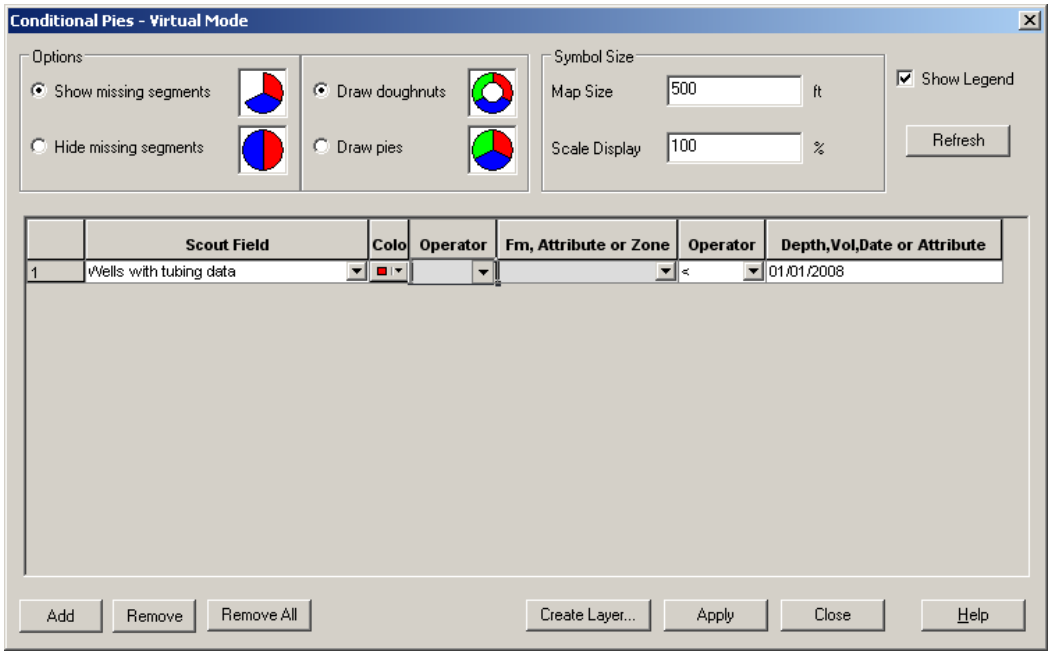
The Molodenski-Baderkas transformation method has been added to the Datum dialog box to provide even more accurate means for converting latitude/longitude coordinate values between various datums.

GeoAtlas

New Criteria for Conditional Pies

In support of the database being expanded to include Tubing and Casing data, the Conditional Pies feature now includes three new criteria for creating Conditional Pies. The new criteria include:

- Wells with mechanical data
- Wells with tubing data >> installed before/after/between
- Wells with tubing equipment >> installed before/after/between



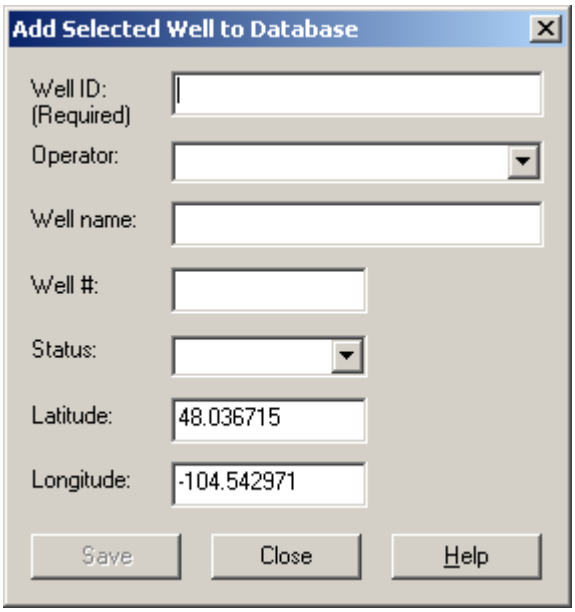
Add New/Selected Well to Database Command

In previous releases adding a well to the database manually required several steps. Starting with this release the process has been streamlined to reduce the number of actions that must be taken to add a new well to the WellBase database.

New menu commands have been added to the **Wells** menu; **Add New Well to Database** and **Add Selected Well to Database**. These commands appear on the right-click drop-down menu when a WellBase layer is active. A new toolbar button also appears on the **View** toolbar.

When the **Add New Well to Database** command is invoked, the **Active entity** is automatically changed to Straight Hole Well, and the **Draw Entity tool** is automatically selected. Click the **Draw Entity tool** on the map location of the well to be added to the database. When you have clicked the Draw Entity tool at the well location the **Add New Well to Database** dialog box opens, where you can add additional information for the new well before committing it to the database.

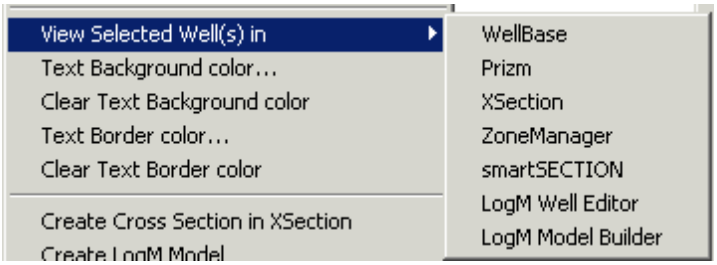
When the **Add Selected Well to Database** command is invoked, the **Add Selected Well to Database** dialog box opens, where you can record additional information before committing the selected well to the database.



Both dialog boxes are identical and are used to commit basic well information to the database.

Usability Enhancement – View Selected Well(s) in

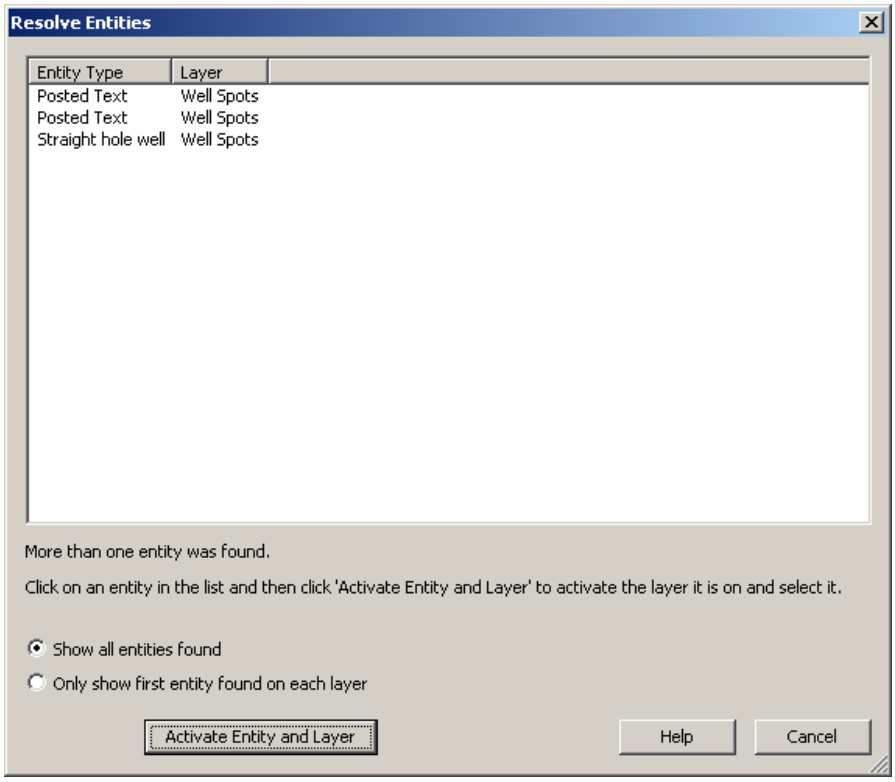
In previous releases the **WellBase Layer right-click menu** contained individual commands to view the selected wells in other modules, which gave the right-click menu a cluttered appearance. Starting with this release of GeoAtlas, the menu has been streamlined to show a cascading menu from one parent command.



This change not only simplifies the right-click menu, but is similar to the View Well(s) options in other Discovery applications.

Usability Enhancement – Activate Layer and Entity

Enhancements have been made to the **Resolve Entities** dialog box (**Activate Entity and Layer** menu command on the **GeoAtlas Map View** shortcut menu) to stream line the user experience



You now have the option to display only the first entity detected on each layer at the selection point.

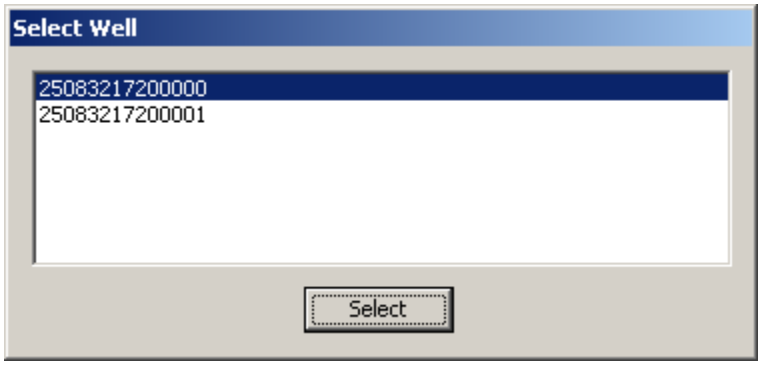
This makes for a convenient way to identify the layer to activate when you are not concerned about activating a specific entity at the selection point.

This option is implemented using radio options added to the dialog box:

- Show all entities detected
- Only show the first entity found on each layer

Usability Enhancement – Selection of Multiple Wells

Occasionally, when you are building a **well-to-well** cross section in GeoAtlas, there may be more than one well at a location. A new feature has been added so that when this situation is encountered, a Select Well dialog box appears.



Highlight the well to include on the cross section, then click the Select button.

ESRI ArcObject Support

New functionality has been added to support the import of **ESRI ArcObject** layers. A new **ESRI ArcObjects** menu command has been added to the **File >> Import** menu. The menu command produces a cascading menu with two options:

- Georeferenced Image Import
- CAD File Import

Each command opens a Windows **File Open** dialog box, where you can select ArcObject layers in a variety of formats for import.

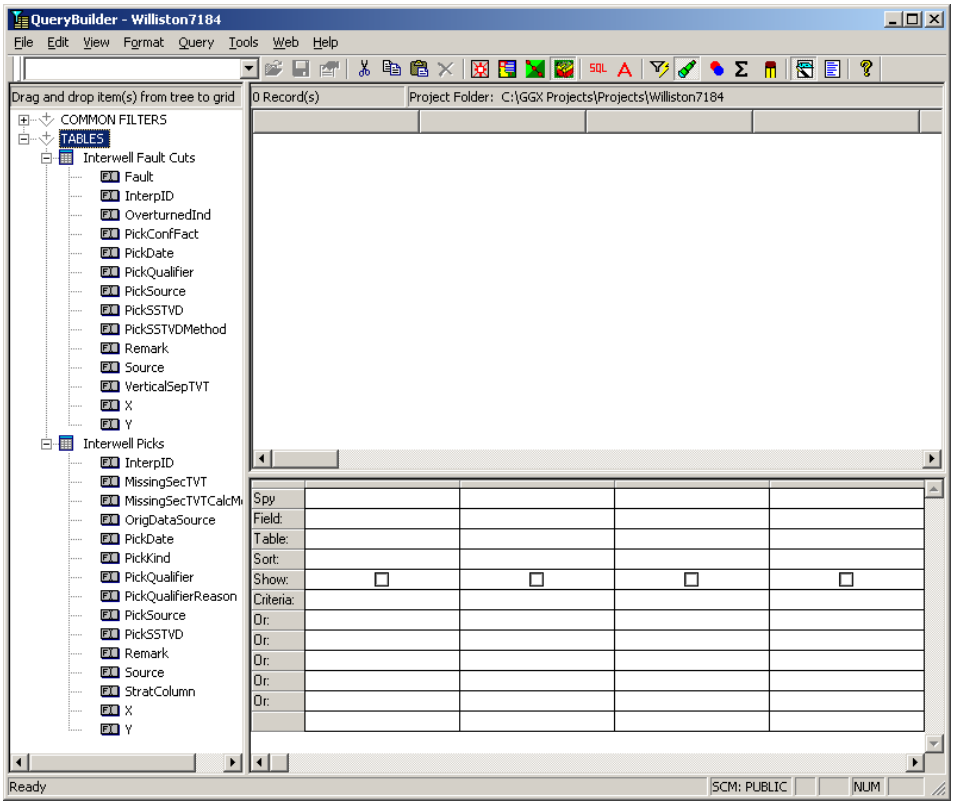
> **Note**: Use of this feature requires that ESRI arcGIS Runtime Engine 9.2 Service Pack 6 be installed. This install is available in the Discovery 5000.0.0.0 Utilities.
>
> **Note**: The first time this feature is invoked, the ESRI license (installed with Discovery 5000.0.0.0) must be validated. The person initiating this feature for the first time must have Administrator rights or be a member of the Power Users group. Subsequently, this feature is available for all users.

QueryBuilder

QueryBuilder Support for smartSECTION

New tables and fields have been added to the posting tree to support smartSECTION data types.

Select **View >> smartSECTION** or click the **smartSECTION** button  on the QueryBuilder toolbar to list the smartSECTION tables and fields.

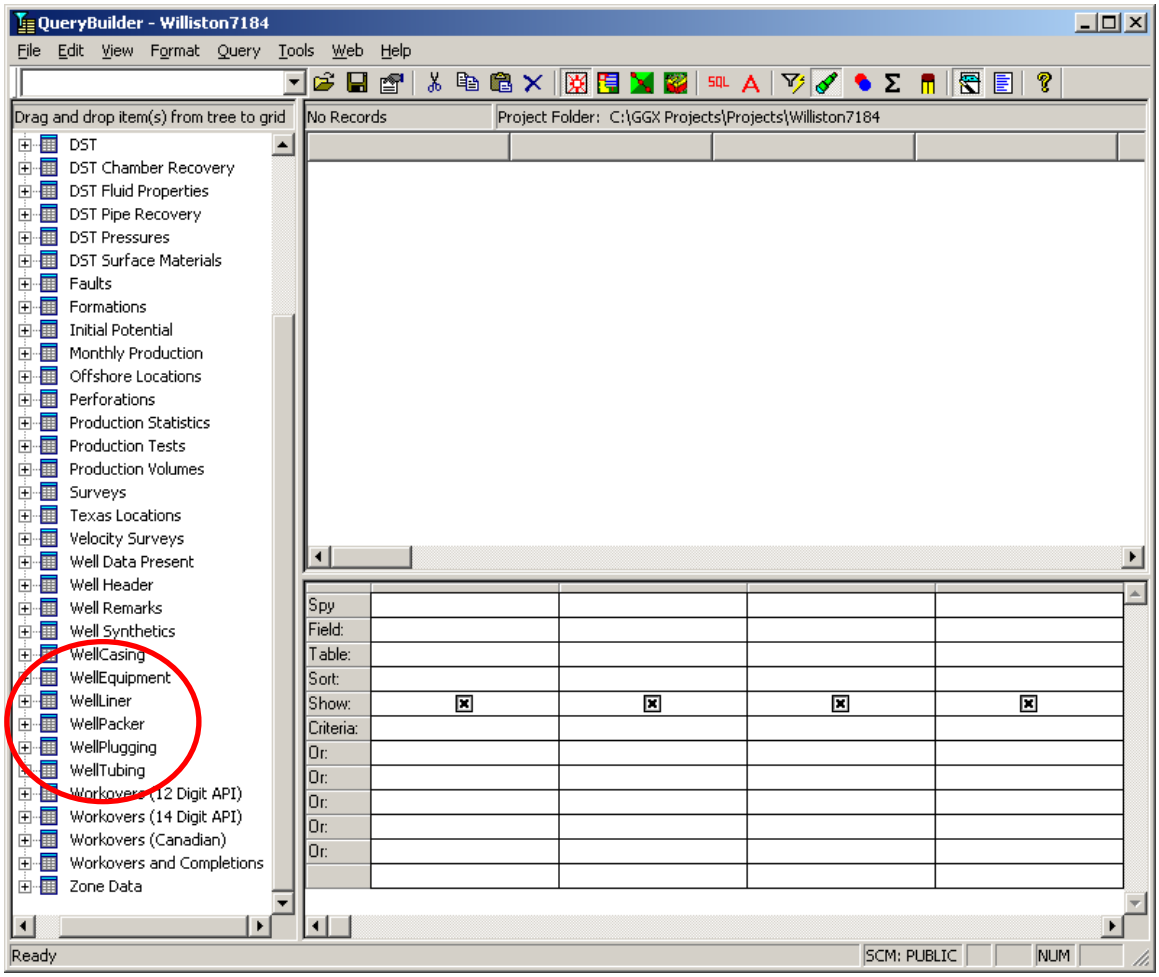


The two new data tables are:

- InterWell Fault Cuts Table
- InterWell Picks Table

New Data Fields to WellBase Queries

To reflect changes to the database, which now includes mechanical data, QueryBuilder has been expanded to include tables that hold completion and plugging information.



The new tables consist of the following:

- WellCasing Table
- WellEquipment Table
- WellLiner Table
- WellPacker Table
- WellPlugging Table
- WellTubing Table

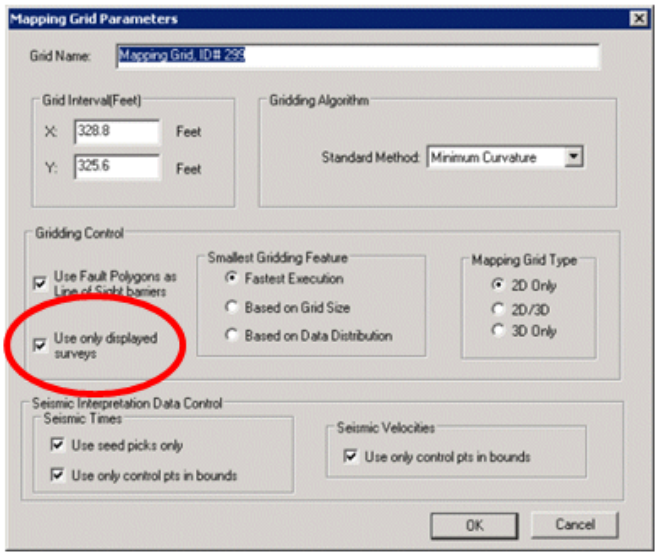
.

SeisVision

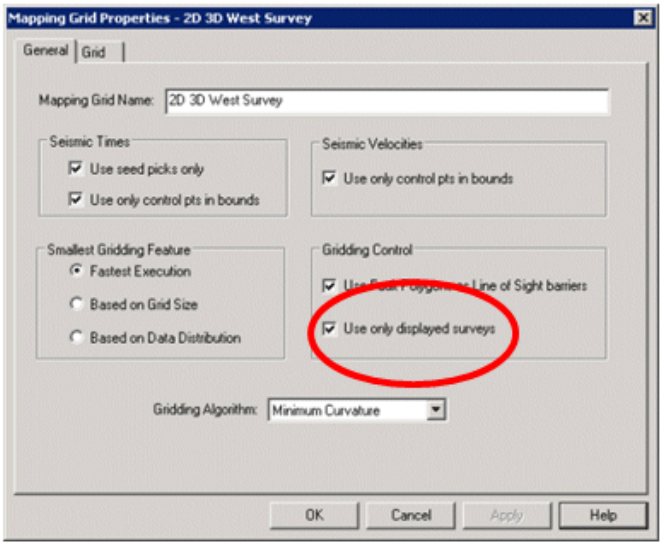
Using Only Displayed Seismic for Mapping

There are occasions when users have 2D data loaded in the interpretation that is not displayed on the map. When this data has been interpreted it is used in the mapping grid. Normally if the survey is not displayed you would not want this survey to be used for gridding the map

A checkbox has been added to the **Mapping Grid Parameters** dialog box.



A similar checkbox has been added to the **General** page of the **Mapping Grid Properties** dialog box.



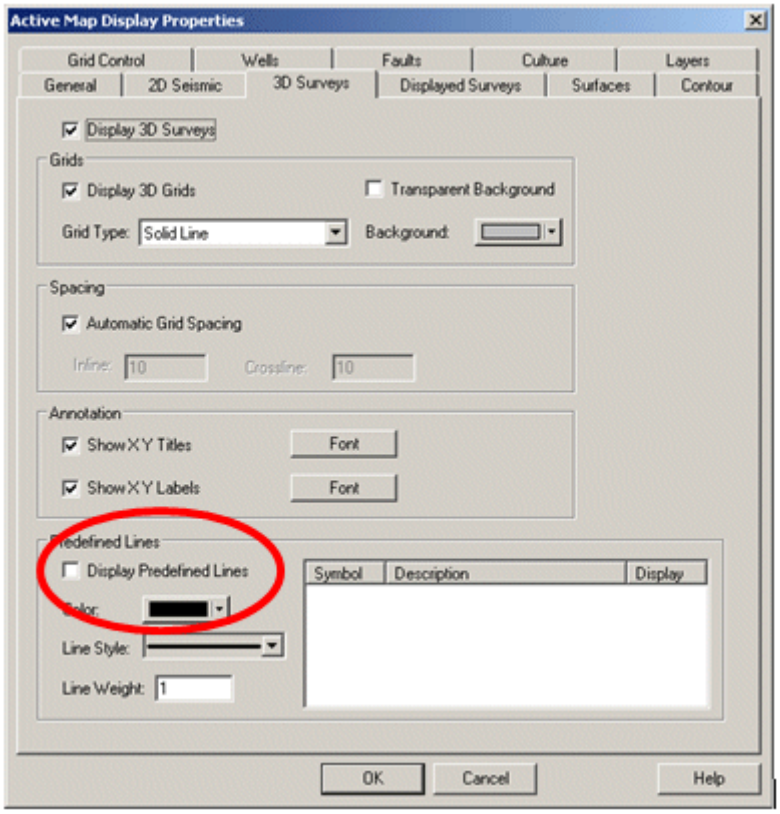
These checkboxes allow you to use only the surveys displayed on the map for seismic mapping.

Selecting a Well on a 2D Seismic Line in Map View

In previous versions of SeisVision, when a well was on or near a 2D seismic line, the **Shift + right mouse button** operation always highlighted and activated the seismic line and not the well. Logic has been added to the program so that when there are multiple entities at the same location, the **Shift +right mouse button** option will preferentially highlight and select the well as the active entity. Additional information can then be readily available for the well using the **Map View Right-Click menu.**

Show Predefined Lines in Map View

You can now show predefined lines in Map View by using the settings on the **3D Surveys** page of the **Active or Default Map Display Properties** dialog box. Turning this feature on initially shows ALL predefined lines in the interpretation. With this feature On, predefined lines can be turned **ON** or **OFF** individually using the **Display** setting listed to the right of the checkbox. When predefined lines are selected (**Shift+Left Mouse Click**) on map views, they can be opened from the map view using the right-click **Display Tools >> Open Selected Predefined Line** from the shortcut menu.



Autopick Right or Left

You now have the option to set the **2D Autopick** tool to pick a horizon to the right or the left of the cursor position on seismic lines.

Standard Mode - Is the initial state of the 2D Autopick tool. In standard mode, the cursor appears with an uppercase **H** next to it  indicating that the Horizon pick tool is active. In this mode the horizon is picked along the event both directions away from the position of the cursor on the seismic line.

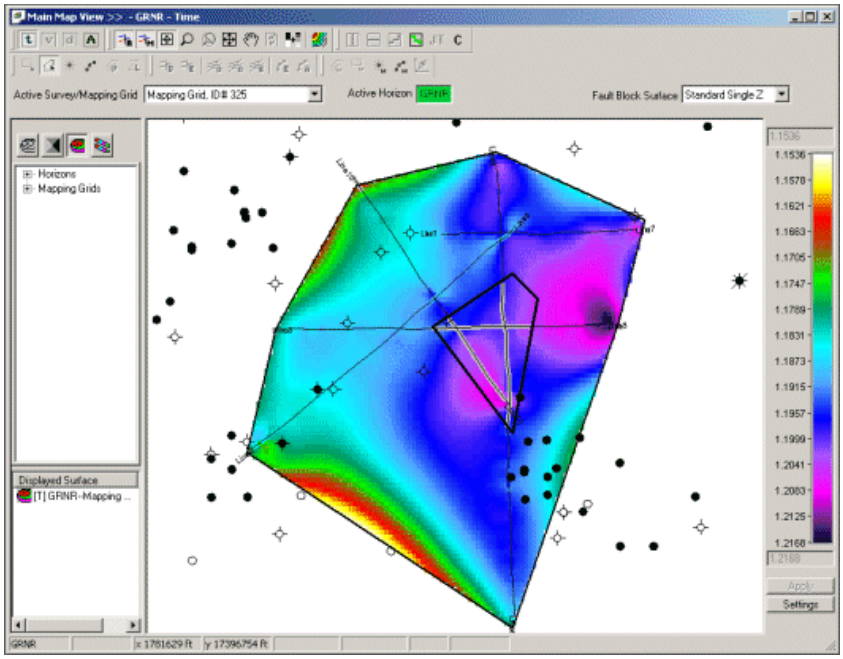
Right Pick Mode - is toggled on and off by pressing the **4** hot key. In this mode, an uppercase **R** will appear next to the cursor  indicating that the horizon will be picked only to the right of the cursor position on the seismic line.

Left Pick Mode - is toggled on and off using the **5** hot key. In this mode, an uppercase **L** will appear next to the cursor  indicating that the horizon will be picked to the left of the cursor position only.

Erase 2d Horizon Picks

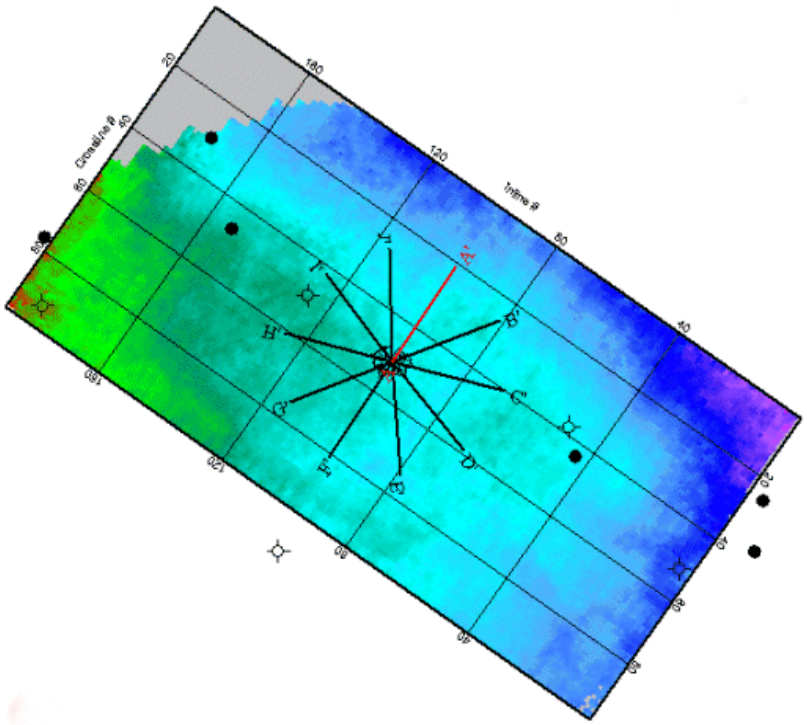
A new menu command has been added to the **Horizons** menu in Main Map View. Selecting the **Erase 2D Horizon Picks** command will erase the active Horizon 2D picks on multiple seismic lines within a subset polygon. This negates the need to erase Horizon picks on individual lines.

When a subset polygon is created on a mapping grid, and the command is invoked, the Horizon picks on all lines within the subset polygon will be deleted.

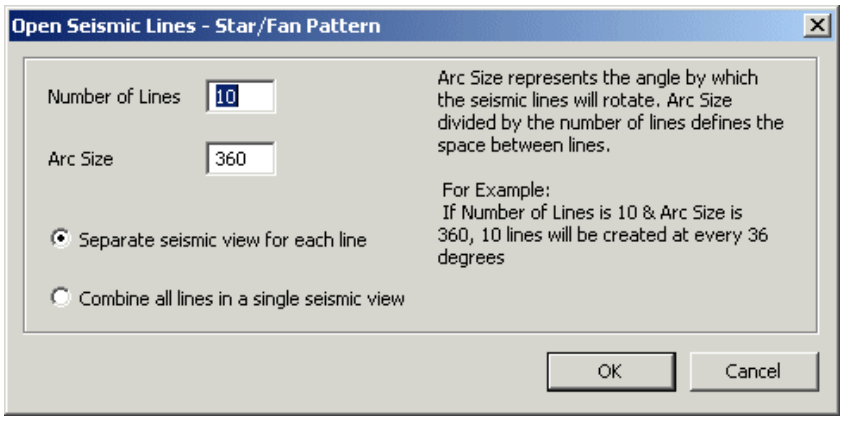


Star and Fan Display Patterns

Starting with this release of SeisVision, you can open a series of inlines, crosslines, or arbitrary lines in a star or fan pattern.



This option is available from a right-click menu on an open seismic line if the seismic window is an Inline, Cross line or Arbitrary line of a 3D survey. This option allows you to open a series of seismic lines in a fan or star pattern. The location of the cursor on the seismic line defines the rotation point about which the other lines will be spread. Selecting this option opens the dialog box shown below.

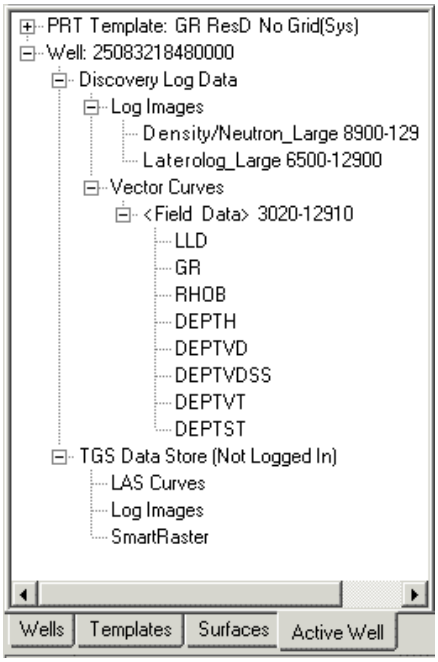


Use this dialog box to define the number of lines and arc of the star or fan pattern.

smartSECTION

Active Well Tab for Cross Section View

An **Active Well** page has been added to the **Wells/Templates/Surfaces/Active Well pane** of the Cross Section view.



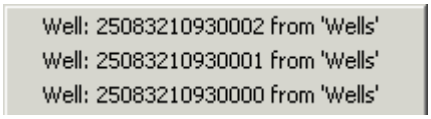
The **Active Well** tab displays data in a tree view that enables you to:

- Select the Log Display Template (PRT) for the well.
- Select the Log Image displayed in Image tracks of the PRT.
- Display Vector Curve inventory
- Display A2D Data Store Inventory with options to add to Shopping Cart.

The Active Well tab makes it easy to adjust a well's presentation (by selecting the PRT file and Log Image for the Image Tracks after defining a multiple well cross section).

Select from Multiple Entities at a Location

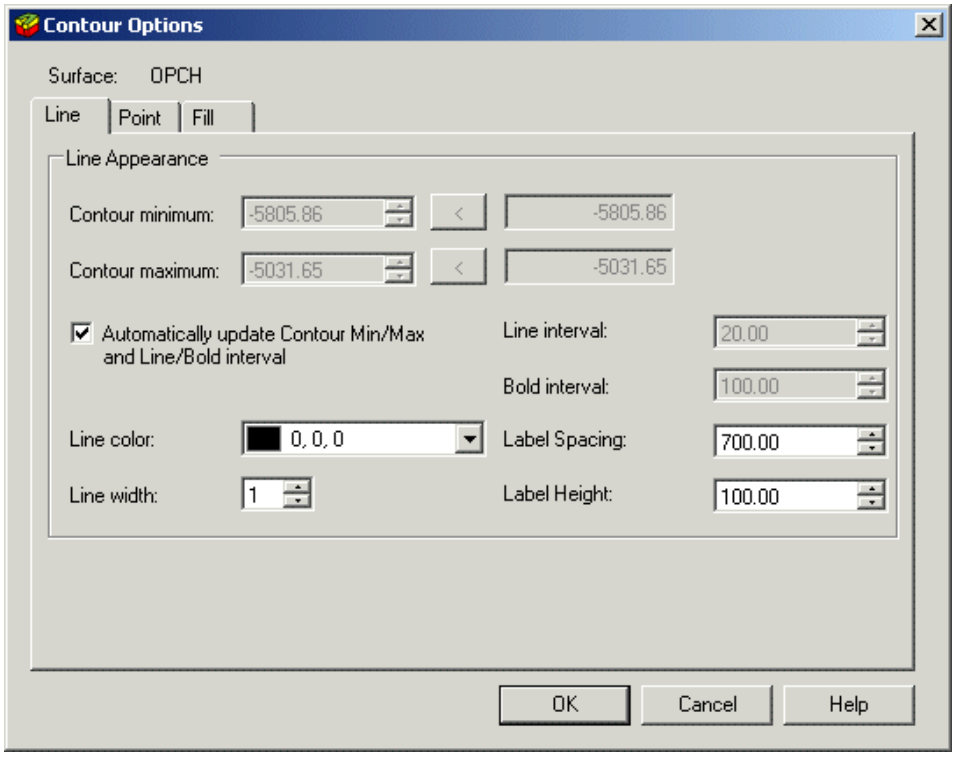
Often times when you are creating a well to well cross section, you might click on a well location that contains multiple wells or completions. Starting with this release of smartSECTION a box will appear that lists all the map entities at that map location.



Select the well to include on the cross section by clicking on it in the list, then continue with the cross section definition.

Add Color to Contour Surfaces

The **Contour Options** dialog box has been expanded to include three separate pages of commands and settings to facilitate the appearance of your maps.

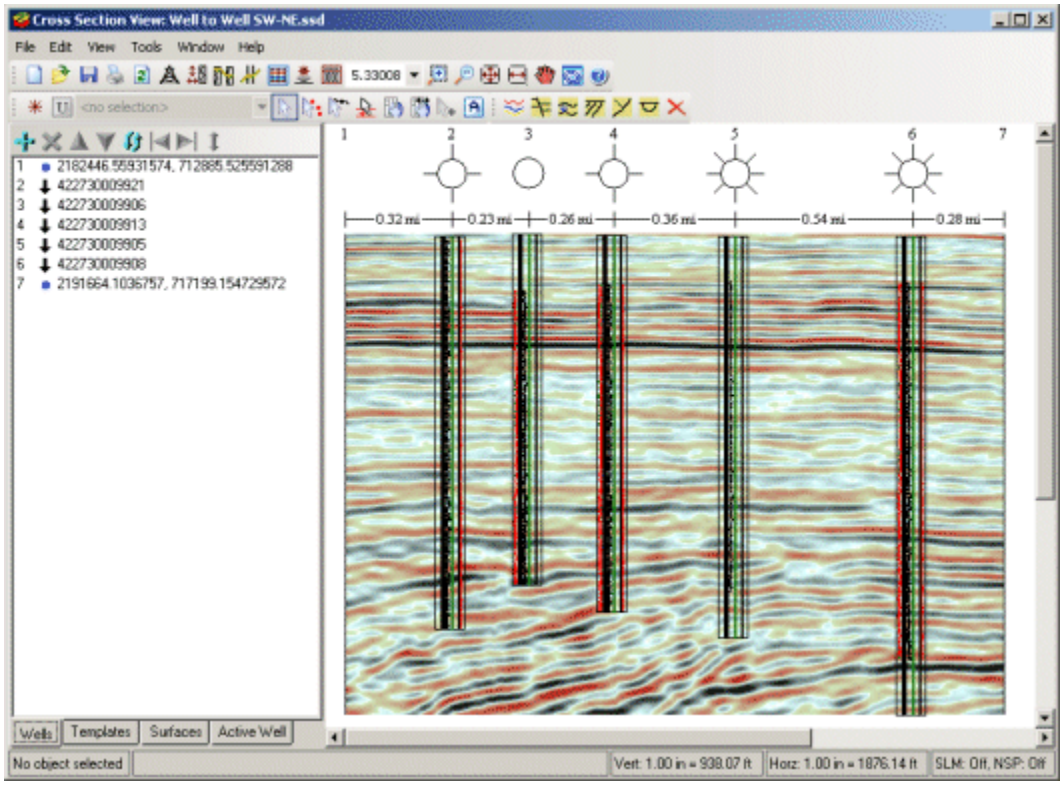


Use the **Line** page to define contour interval and style. Use the **Point** page to turn on or off well points or inter-well points. Use the **Fill** page to can add color to your contour surface maps.

Seismic Backdrop for Cross Section View

You can now show a 2D line or a 3D survey as a background on a cross section.

> **Note**: This feature is available for Discovery projects only. It is currently not available for Discovery on OpenWorks projects.



A seismic interpretation must be saved in SeisVision prior to using this new feature. The **Seismic Backdrop** feature, accessible from the **View** menu in Cross Section View, allows you to view 2D and 3D seismic data along the line of section in Cross Section View.

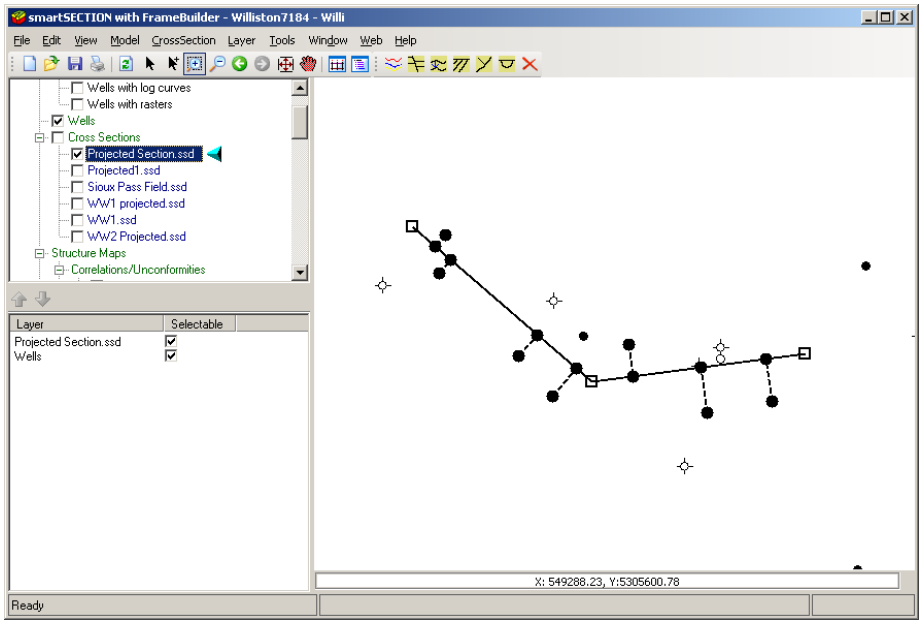
Once the seismic backdrop is shown in Cross Section View, you can change the appearance using the **Seismic Backdrop Options** dialog box (View >> Seismic Backdrop Options), which is accessible either through the context menu or from the **Cross Section Display Preferences - Display Options Page**.

If the SeisVision interpretation is updated or changed you can update the seismic backdrop on saved cross sections using the **View >> Update Seismic Interpretation** menu command.

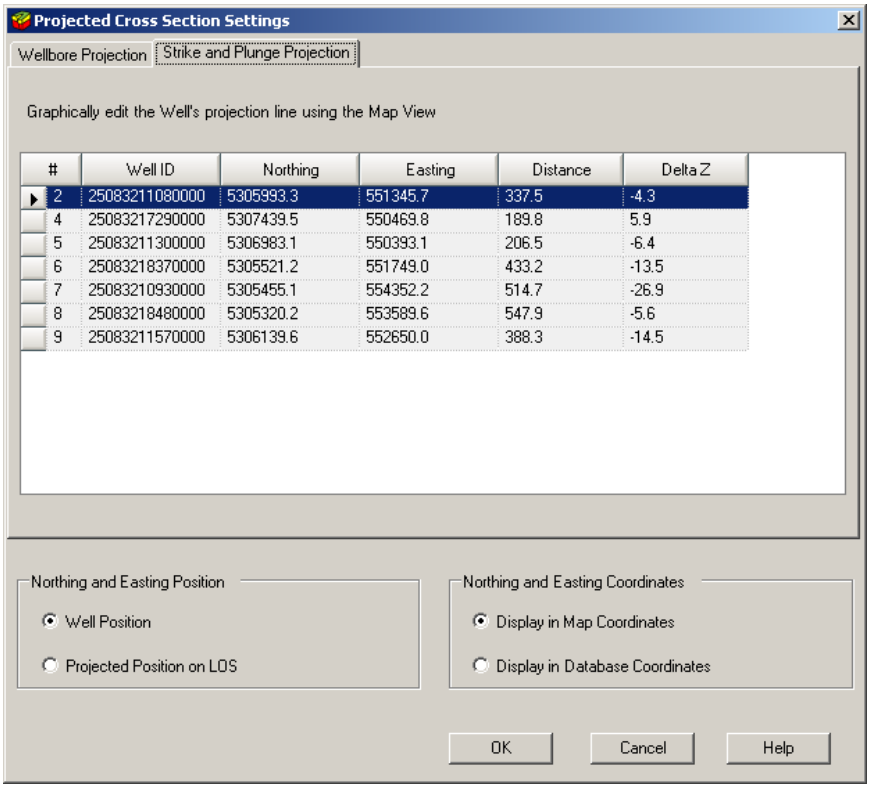
Information about the 3D survey or 2D seismic line can be obtained using the **Seismic Properties** context menu command, which is available on the Cross Section View context menu when the Seismic Backdrop is active.

Projected Cross Sections

With the current release of smartSECTION, you can create projected cross sections. A command on the **Map View** menu (**Cross Section** >> **Define Projected**) allows you to select X/Y points, which define the projected line of section. Wells are then selected for projection onto the line of section.



The **Projected Cross Section Settings** dialog box, opened from the **Layout** page of the **Cross Section Display Preferences** dialog box, summarize the well location, location of the projected well on the line of section, projection angle (bearing) and difference in elevation between the well and the line of section.



LOGarc Integration

This feature provides an integration between the **smartSECTION®** software and the **LOGarc™ Version 3.2.1.00** product.

LOGarc is a Windows desktop application provided by **LogTech Canada, LTD** that enables you to search for and retrieve well log data from **LOGarc** data servers. An account must be active with LogTech Canada, LTD to access their database.

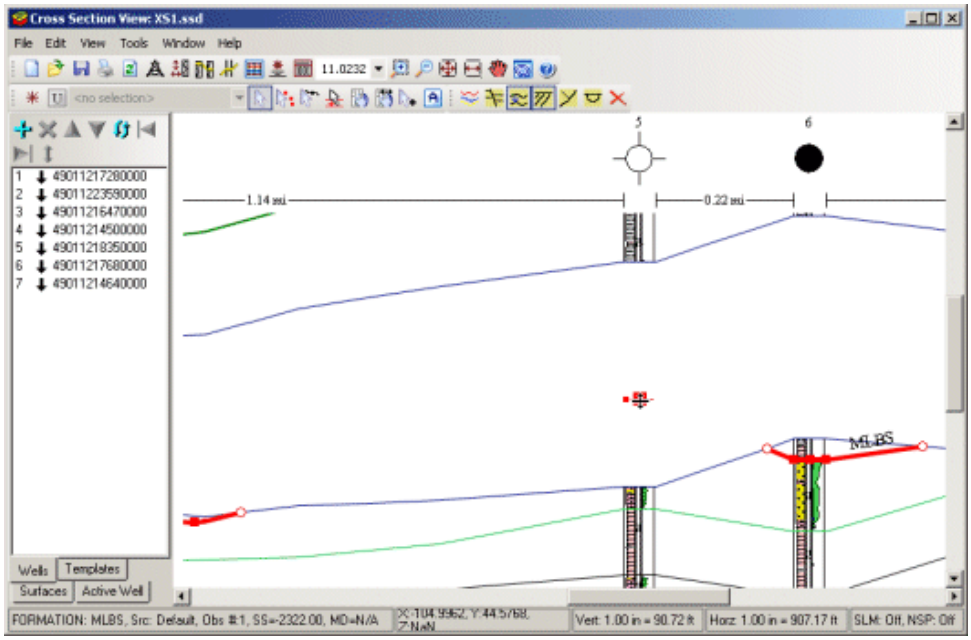
The feature is launched using a right-click menu in Map View after one or more wells have been selected in the Map View window.

You can select the data to download within the **LOGarc** application and retrieve log data from the **LogTech** database. The s**martSECTION** application will import well log data placed in the folder specified by **LOGarc** during the download.

Missing/Restored Tops to Map Surface Geometries

Restored Tops are tops missing from a well due to erosion, and restored to their original position within an **Unconformity Gap**.

The Restored Tops within an Unconformity Gap can be used as data points when the surface is mapped so that their restored position within a gap has influence on the shape of the surface, and surface/Unconformity intersection in the vicinity of wells with missing tops.

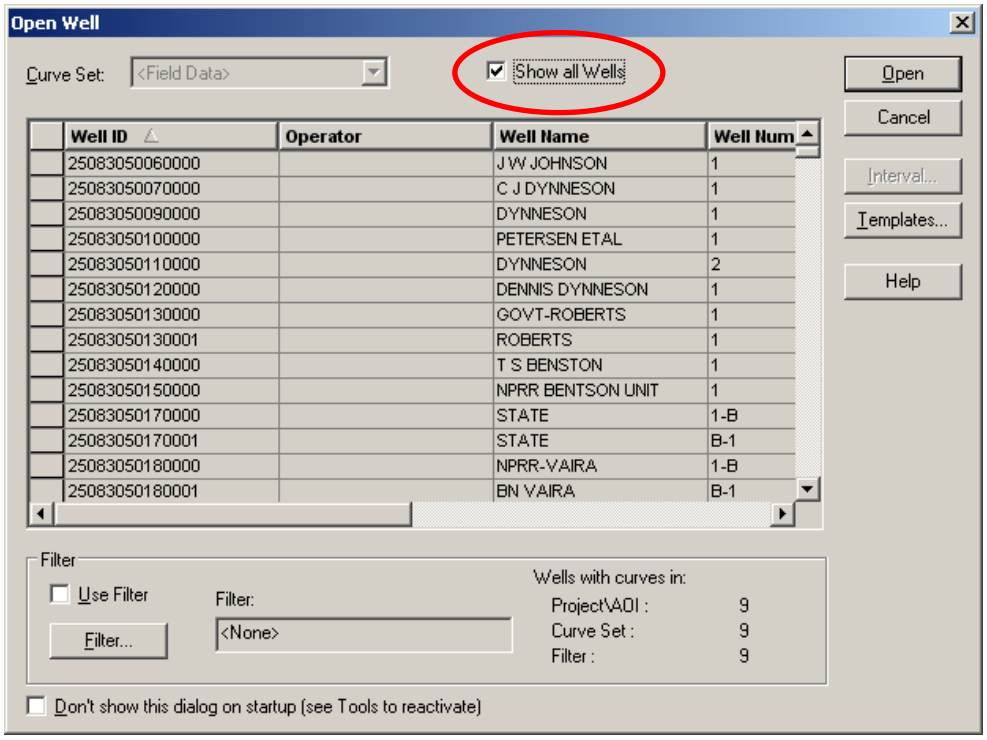


A checkbox has been added to the **Surfaces** page of the **GeoSurface Model Properties** dialog box where you can toggle on and off the Restored tops to use for mapping.

PRIZM

Show All Wells in PRIZM

A **Show all Wells** checkbox has been added to the **Open Well** dialog box (**File >> Open Well**) that allows you to select a well from a list of all the wells in the project.



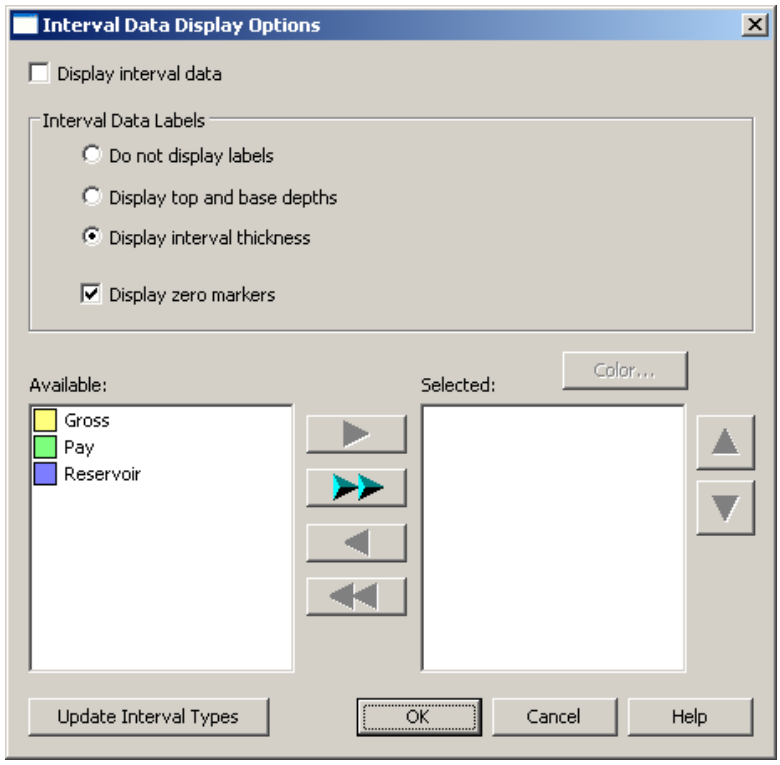
This feature allows you to open a well in PRIZM that has no curve data. Once the well is opened in PRIZM, you can select **File >> Save Well** to save a depth track only. Or, you can add curves to the well to support on-screen digitizing. You can also create a log template consisting only of an Image track to display raster logs on cross sections.

The **View Wells >> In PRIZM** command in all other applications (WellBase, GeoAtlas, XSection, smartSECTION, ZoneManager, etc.) will open the well in PRIZM and display it empty if there is no curve data for the well.

Update Interval Data Types

ASCII4 exports and imports transfer Interval data between projects. After a data transfer, the interval types in the database could be different than the list of interval types in XSection. In past releases, the list of interval types had to be rebuilt with the consequence of the loss of the default colors for the Interval Data Types.

Starting with this release, The **Update Interval Types** command button has been added to the **Interval Data Display Options** dialog box (**View >> Interval Data** or **Tools >> Interval Data >> Display Options**) that will allow you to update the list of interval data types in PRIZM.



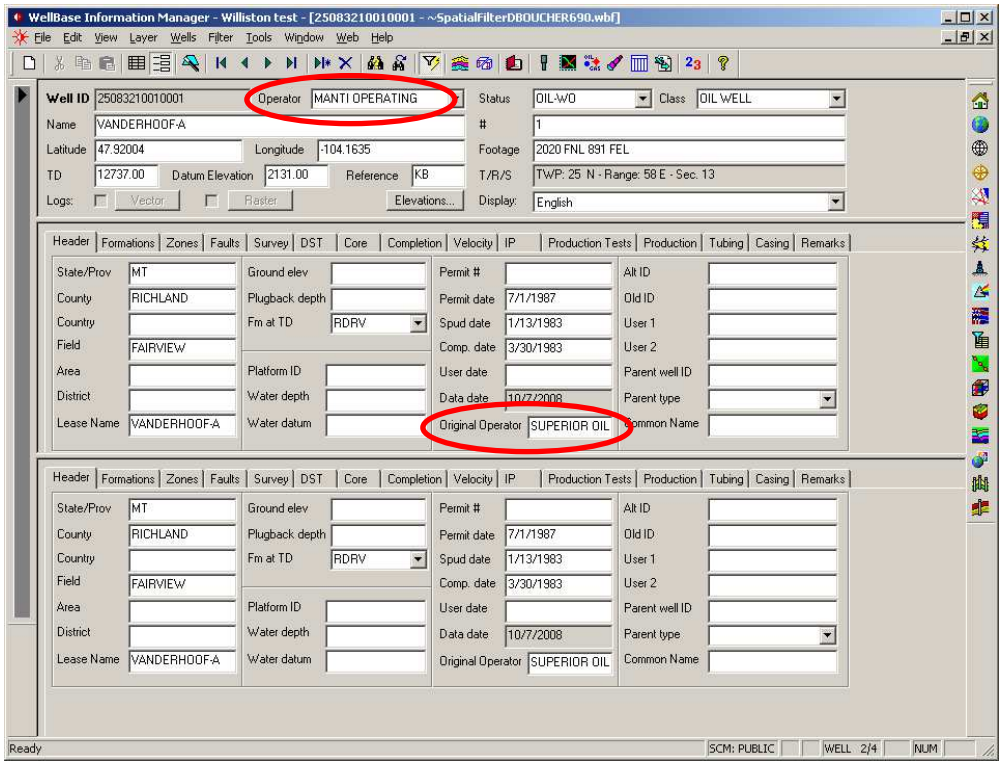
The dialog box has been further improved by showing the default color of the interval types in the list boxes. A **Color** button has also been added so you can change the color of interval types by choosing from a palette of standard colors or creating a custom color.

WellBase

Original Operator Field Added to the Information Manager

A well's operator may change several times over its producing life. Because state and federal records are often tied to the original operator of the well, knowing this information (usually associated with the last four digits of the well's API number) is critical to customers because it provides access to historical well data.

A new field has been added to the **Header Page** of the **Information Manager** that records the **Original Operator** as defined in the initial IHS 297 Well Data Import file.

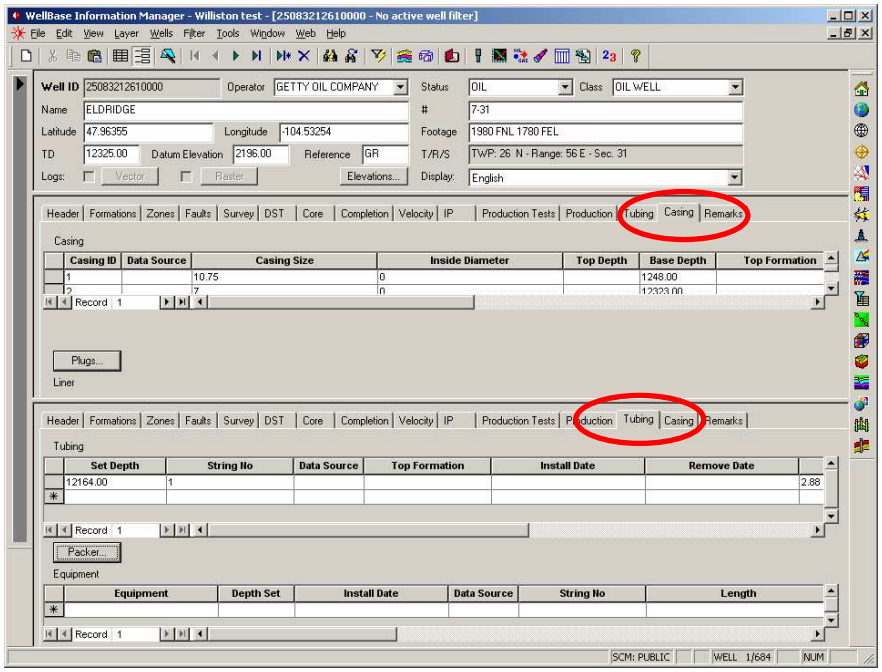


If ownership has changed during the life of the well, the **Operator Field** on the **Scout Ticket** view will show the most current operator as defined in the IHS 298 Production updates. The Header page will continue to list the original operator.

Mechanical Data Added to the Database

The WellBase database has been expanded to store information relating to tubing and casing. Two new pages have been added to the Information Manager.

The **Tubing Page** stores information about tubing, tubing equipment and packers. The **Casing Page** stores information about casing, liner and plugs.



The information in these two pages can be viewed graphically using the **Well Summary Tool** (**Tools >> Build Summary List**, then **Tools >> Well Summary**).

QueryBuilder has been expanded as a result with six new tables containing **Casing** and **Tubing** data that you can query for information.

As a consequence of the addition of Mechanical data to the database, six new records are added to the **ASCII4 Format**. The new data records are:

- The Casing Record (MC)
- The Liner Record (ML)
- The Tubing Record (MT)
- The Tubing Equipment Record (ME)
- The Plugging Record (MP)
- The Packer Record (MK)

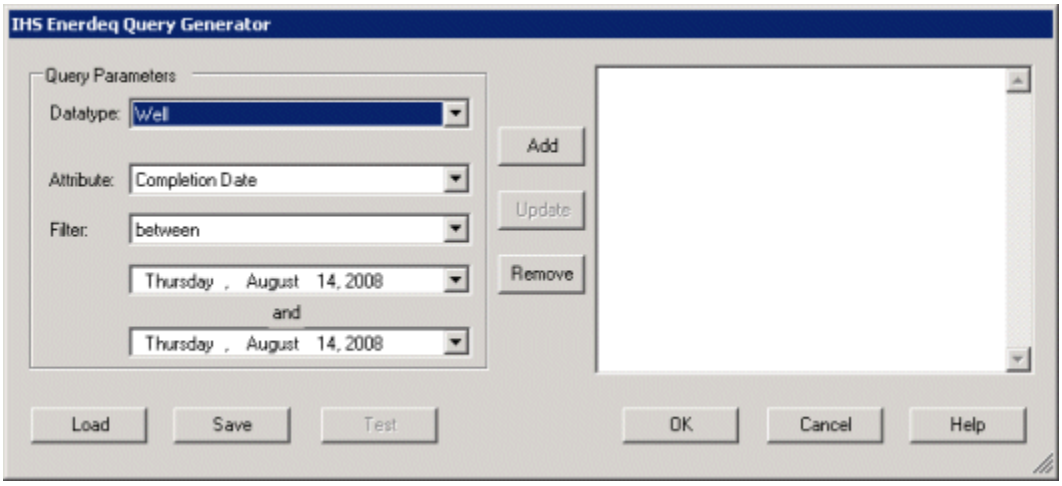
You can now also use the **Spreadsheet Importer** to move Casing and Packer data into the database (*Discovery* projects only).

Also as part of this feature, the **Conditional Pie Tool** has been expanded to include three new **Conditional Pies Criteria**.

- wells with mechanical data
- Wells with tubing data >> Installed Before/After/Between
- Wells with tubing equipment data >> Installed Before/After/Between

IHS Enerdeq Imports Improvements

The **IHS Enerdeq** import feature allows you to import the most current IHS well and production data directly into *Discovery* projects by connecting to the IHS Enerdeq web-based delivery system. In previous releases, the volume of data imported was dictated by the extents of the active project or AOI. Starting with this release, you can now filter the import to limit the amount of data extracted from the **IHS Enerdeq** database. Filters are created using the **IHS Enerdeq Query Generator** dialog box.



You can filter on data types of:

- Wells
- Production Unallocated
- Production Allocated
- Activity

The filter is applied to the IHS Enerdeq database to the established extents of the active AOI or project. Only data meeting the filter criteria and falling within the established extents will be imported.

The import is set up in *Discovery* in similar manner to the **Batch Import** feature in WellBase. You can define the type of data to import (well or production), and define specific import settings the same way you would when making data imports from an IHS data file. After the import settings are defined, you can either import the data immediately or schedule the import for a later time.

WellHeader Is Not Editable Flag

A **WellHeader is not editable** flag may appear in the WellBase **Status Bar** under certain conditions in *Discovery on OpenWorks* projects.

If you have Limited Interpreter or Browser rights, or if you are in Interpreter that does not match the data_source in OpenWorks, the Well Header table will be protected.

If you are an Interpreter that matches the data_source in WellBase, you can edit data to your source.

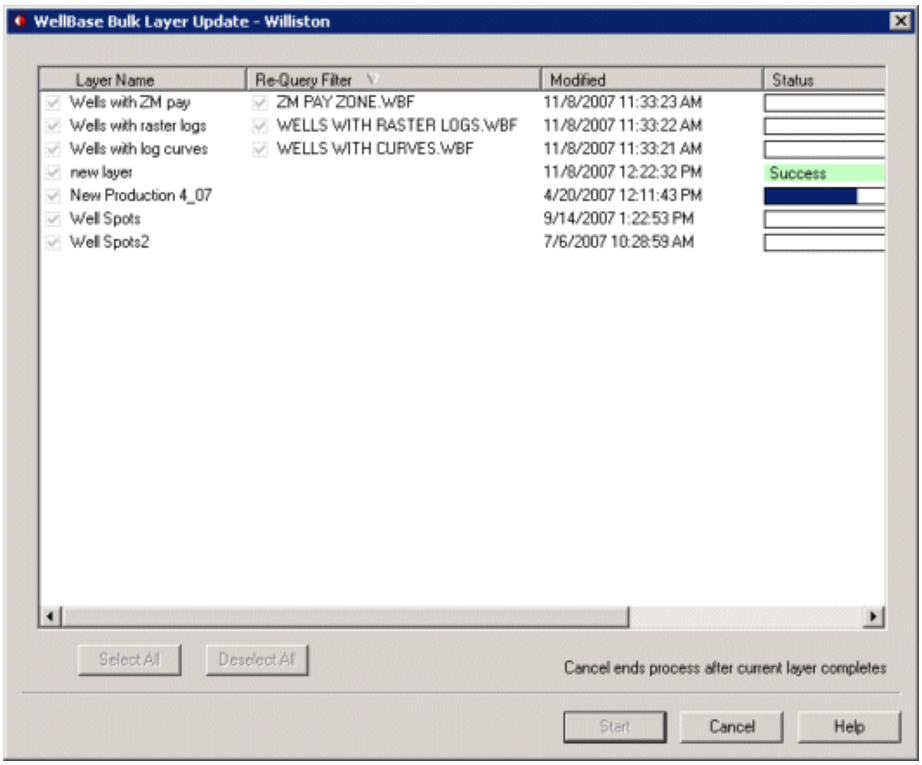
If you are a Manager in the OpenWorks project, you can edit data to any source.

The "not editable" status will not apply if the data_source in OpenWorks is empty.

Re-Query Database During Bulk Update of WellBase Layers

You now have control over whether or not a WellBase layer is re-queried during a **Bulk Layer Update**.

Previously, there was no way of knowing if the layers selected for bulk update were going to be re-queried or not. With this feature a **Re-Query Filter** column is added to the **Bulk Update WellBase Layers** dialog box.

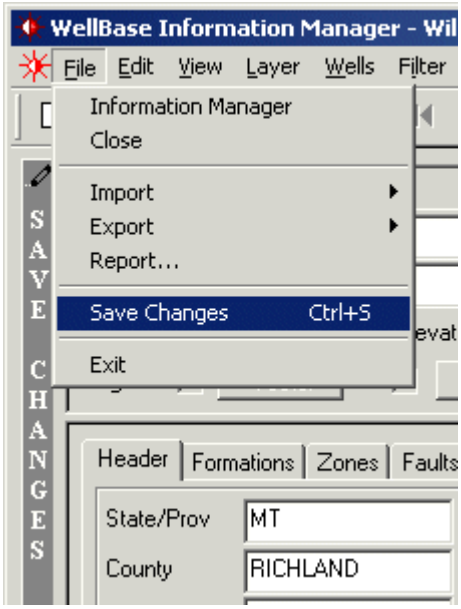


This column contains a checkbox and the name of the filter used to generate each layer. Checking the box will indicate to the program if the filter listed should be used to re-query the database during the update process.

Save Changes Menu Command and Bar

A new **Save Changes** menu command has been added to the **File** menu to simplify the procedure to commit edits to the WellBase database.

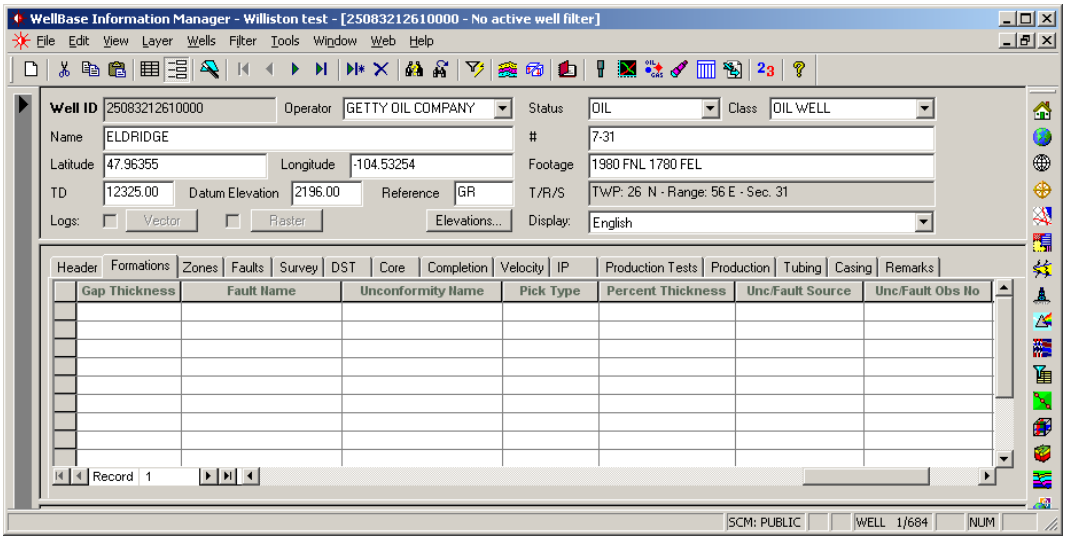
The words **SAVE CHANGES** also appear on the **Edit Status** toolbar when you edit any data field in the WellBase Information Manager as an easy reminder to commit the changes to the database.



Edits are committed to the database by using the menu command or clicking on the bar. The Words **SAVE CHANGES** disappear when the changes are committed to the database.

New Fields in the Formation Table

Seven new fields have been added to the **Formations Page** on the Information Manager to accommodate data generated in smartSECTION.



Data entered in these fields is derived by using the mapping capabilities in a **smartSECTION with Discovery FrameBuilder** geologic model. The seven new fields include:

- **Gap Thickness** - This is the missing section (or gap) within the formation produced by Faulting or an Unconformity.
- **Fault Name** - This field provides the name of the parent Fault when a Missing Top is absent due to faulting.
- **Unconformity Name** - This field provides the name of the parent Unconformity when the Missing Top is absent due to erosion because of an Unconformity.
- **Pick Type** - For this release, the Pick Type is set to Missing Top to designate the formation record ID for a missing top.
- **Percent Thickness** - The Percent Thickness value represents the position of the missing top (in percent) within the gap produced by faulted or eroded section.
- **Unc/Fault Source** - The Unc/Fault Source represents the Source of the recorded parent Unconformity or parent Fault using the Source Manager hierarchy.
- **Unc/Fault Obs No** - It is the Observation Number of the parent Unconformity or parent Fault.

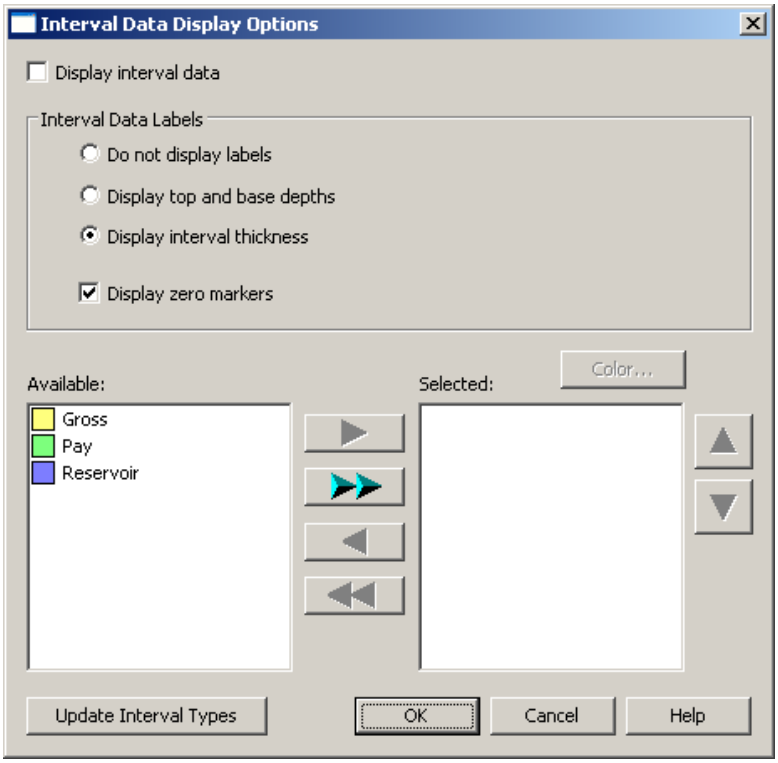
These data fields have also been added to the **Well_Formation** table in the **ASCII4 Format** data scheme, making the data available for import and export.

XSection

Update Interval Data Types

ASCII4 exports and imports transfer Interval data between projects. After a data transfer, the interval types in the database could be different than the list of interval types in XSection. In past releases, the list of interval types had to be rebuilt with the consequence of the loss of the default colors for the Interval Data Types.

Starting with this release of XSection the **Interval Data Display Options** dialog box has been updated to alleviate this problem.



This dialog box is identical to the one newly available in PRIZM (described above)

The changes to this dialog box include:

- The default colors are now displayed along the side of the Interval Data Types in the list boxes.
- A color button has been added to change the default color of any Interval Data Type listed in the Selected list box.
- The Update Interval Types command button allows you the functionality to update the list in XSection so that it is in sync with the Interval Data Types in the database.

ZoneManager

Transfer of Data from DSS to ZoneManager

In the Discovery 5000.0.0.0 release, data can be transferred directly from **DSS™ 5000.0.0.0**, the **GeoGraphix Dynamic Surveillance System,** to ZoneManager. In prior releases, an ASCII file had to be produced in DSS and the data file had to be imported into ZoneManager. This feature is available for both Discovery and Discovery on OpenWorks projects.

The **ZoneManager Transfer** command is available on the **File** menu in **DSS** in a Discovery Linked DSS project.

This command opens a series of dialog boxes where you can select data to transfer (either from a table or a Case), and the target zone and attribute. There is also an option to create a new attribute through DSS.

DSS must be installed on your system to use this feature.

General Release Notes

1. In Discovery 5000.0.0.0, the WellXchange application supports GXDB and GES97 data exchanges; it no longer supports OpenWorks data exchanges. GeoGraphix is actively investigating alternatives to replace this functionality.

2. GXDB database support has advanced to Sybase v.10. As a result of this change, during the upgrade of GXDB projects, the project database will undergo an unload/reload operation.

    - To facilitate this operation, it is recommended that you have 3 times the size of the project as empty disk space on the hard drive on which the project is stored.
    - A copy of **original** Sybase 9.0 database is automatically saved in the GeoGraphix project directory during the upgrade to Sybase version 10.0. The backup database files are named gxdbR.db, gxdb_productionR.db and gxdbR.log.

      If a project upgrade fails, follow these steps:

        1. Delete the files gxdb.db, gxdb_production.db and gxdb.log in the project directory or move them to another area on disk.
        2. Rename the database files with the "R" suffix in the project directory to gxdb.db, gxdb_production.db and gxdb.log.
        3. Archive the project.
        4. Call customer support for assistance.

      This is equivalent to archiving the project before the upgrading to Discovery 5000.0.0.0.

      Note: Users should **always** archive their projects prior to upgrading to the newest version of Discovery. Automatic backup of the database files during the upgrade process provides additional protection

3. The LandmarkConnect install has been retired, and replaced with a new "OpenWorks Basic" install.

    - The OpenWorks Basic install does not require Hummingbird Exceed.
    - If the OpenWorks Basic installation is used, the Oracle client can be installed with "Administrator" installation type, which will include all of the needed components. Or, the Oracle client installation for the OpenWorks Basic install can use the "Custom" installation type. If using a custom install, the following Oracle components must be installed:

        1. Oracle Database Utilities 10.2.0.1.0
        2. SQL *Plus 10.2.0.1.0
        3. Oracle JDBC/THIN Interfaces 10.2.0.1.0
        4. Oracle Net 10.2.0.1.0

    - Please see the OpenWorks documentation for more detailed information on the OpenWorks Basic install.

4. LogDigitize is only supported for XP32. It is not supported for XP64 or Vista32 client Operating Systems.

5. Discovery now supports importing ESRI ArcObjects Georeferenced images and CAD files. This functionality requires that ESRI ArcGIS Engline 9.2, Service Pack 6 be installed (install is available within the Discovery Utilities LSM download or in the Utilities folder on the DVD). The first time the functionality is called from GeoAtlas, you must be logged in as either an Administrator or part of a Power User group to activate the ESRI license. Once the license is activated, a standard user can subsequently run the software and access the feature.

6. TracPlanner Xpress workflows involve running both the Discovery 5000.0.0.0 and WellPlanning - Discovery 5000.0.1.0 applications. In order to run this workflow on an XP64 operating system, you must install WellPlanning - Discovery from the Windows 32 bit version of the DecisionSpace 5000.0.2.0 install, and have the 32 bit version of the Oracle client on the computer. TracPlanner Xpress workflows are not currently supported using the Windows 64 bit version of WellPlanning - Discovery.

Vista Specific Known Issues

1. TracPlanner Xpress workflows involve running both the Discovery 5000.0.0.0 and WellPlanning - Discovery 5000.0.1.0 applications. WellPlanning - Discovery is not yet supported on Vista, thus the integrated TracPlanner Xpress workflows are not yet supported on Vista.

2. LogDigitize is not supported for Vista.

3. At the current time, integration workflows between Discovery and LogM/STRUCT applications require that the user have Administrator rights. Examples of the integration include operations such as in GeoAtlas, selecting a well and choosing View Well in Well Editor, or in SeisVision selecting a well from SV Vertical View and choosing the LogM Well Editor option.

4. Vista users may experience problems in smartSECTION Cross Section View when trying to move objects with the mouse (such as moving a pick on a well). If you experience this issue, it is recommended that you either disable Vista's Aero theme, or that you launch smartSECTION with elevated privileges ("Run as administrator").

5. If you are running Discovery on a Windows XP client and remotely accessing projects on a Vista32 computer, you may see ODBC errors when trying to activate the projects. If you experience this issue, it is recommended that you set the Database Client (in System Options) to "Include server IP address in client connection parameters".

Third Party Acknowledgements

Landmark acknowledges that certain third party code has been bundled with or embedded in Landmark's software. The licensors of this third party code and the terms and conditions of their respective licenses may be found at the following locations:

- In the Discovery Release Notes (accessed by the **Help >> Discovery Release Notes** menu command in any Discovery module).
- In the Online Help files. (In the **Contents >> 3rd Party Acknowledgements** in any Discovery application).

International Trade Compliance

This application is manufactured or designed using U.S. origin technology and is therefore subject to the export control laws of the United States. Any use or further disposition of such items is subject to U.S. law. Exports from the United States and any re-export thereafter may require a formal export license authorization from the government. If there are doubts about the requirements of the applicable law, it is recommended that the buyer obtain qualified legal advice. These items cannot be used in the design, production, use, or storage of chemical, biological, or nuclear weapons, or missiles of any kind.

The ECCN's provided in Release Notes represent Landmark Graphics' opinion of the correct classification for the product today (based on the original software and/or original hardware). Classifications are subject to change. If you have any questions or need assistance please contact us at FHOUEXP@halliburton.com**.**

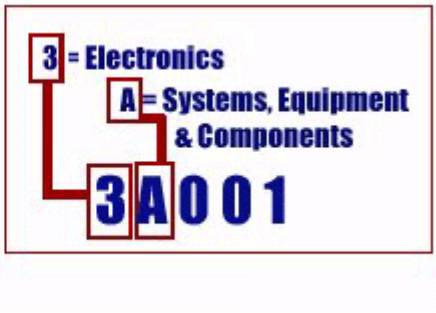
Under the U.S. Export Administration Regulations (EAR), the U.S. Government assigns your organization or client, as exporter/importer of record, responsibility for determining the correct authorization for the item at the time of export/import. Restrictions may apply to shipments based on the products, the customer, or the country of destination, and an export license may be required by the Department of Commerce prior to shipment. The U.S. Bureau of Industry and Security provides a website to assist you with determining the need for a license and with information regarding where to obtain help.

The URL is: http://www.bis.doc.gov.

Definitions

CCATS (Commodity Classification Automated Tracking System) - the tracking number assigned by the U.S. Bureau of Industry and Security (BIS) to products formally reviewed and classified by the government. The CCATS provides information concerning export/re-export authorizations, available exceptions, and conditions.

ECCN - Export Control Classification Number - The ECCN is an alpha-numeric code, e.g., 3A001, that describes a particular item or type of item, and shows the controls placed on that item. The CCL (Commerce Control List) is divided into ten broad categories, and each category is further subdivided into five product groups. The CCL is available on the EAR Website.



Customer Support

If you have software technical questions that cannot be answered by referring to the Help files contained in each GeoGraphix application, then you can contact GeoGraphix Customer Support.

If you find aspects of GeoGraphix applications that appear difficult to use, or that do not meet expectations, please advise us. Your ideas for enhancements are valuable, and your suggestions drive ongoing GeoGraphix development.

GeoGraphix Customer Support is available in several regions around the world and can be contacted via our Web site, e-mail or telephone.

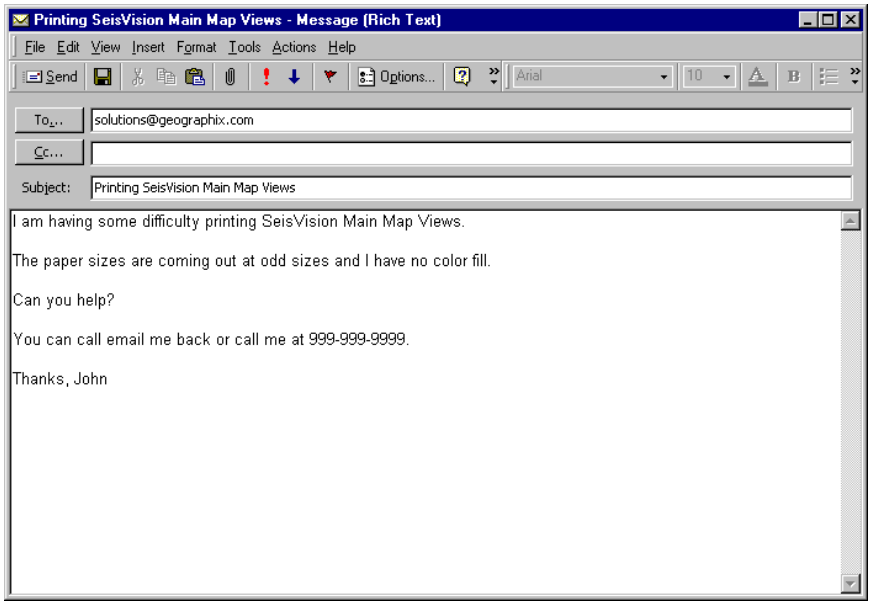
Selecting the **Online Support** menu command from either the **Web** or **Help** menu in any GeoGraphix module accesses GeoGraphix Customer Support.

Visit Our Customer Support Web site:

http://css.lgc.com/CustomerSupport/CustomerSupportHome.jsp

E-mail GeoGraphix:

solutions@geographix.com



Call GeoGraphix*:*

1-877-435-7542
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For telephone and fax numbers of our other international support locations, use the GGX Support button in any GeoGraphix application Help Window's navigation bar (at top of window) or visit our Web site.