Release Notes

WebSteering

Stay ahead of the drill bit

Release Notes for GVERSE WebSteering 2016.1.2

GVERSE™ ara

GEOSCIENCE & ENGINEERING SOLUTIONS

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Introduction

LMKR is pleased to announce the release of the GVERSE™ WebSteering™ 2016.1.2 software. This document provides an introduction to the WebSteering software features and benefits. It also lists the system requirements necessary to install and run the software.

What is GVERSE WebSteering?

GVERSE WebSteering software is designed specifically to help geoscientists geosteer horizontal wells in thin pay zones and to direct the bit in real time.

The GVERSE WebSteering software installs into the web browser with a few button clicks. Then it's a simple process to load LWD and surveys from the rig, add type logs and subsurface grids from GeoGraphix®, and start steering. At any point during this process, LWD data can be sent back to GeoGraphix for further analysis using GeoGraphix's feature-rich suite of tools. GVERSE WebSteering runs even when disconnected from your corporate network so whether you are in the office or working remotely, you can define your target surface and send updated drilling targets to the rig. The WebSteering software is part of the GVERSE application suite by LMKR (http://www.lmkr.com/gverse).

LMKR GVERSE consists of geoscience and engineering solutions focused on workflow optimization and enhancing productivity of teams working on diverse geological and geophysical projects. These applications help cut the processing time required for interpretations resulting in fast, easy to use scalable tools that are inter-operable with other known geoscience software suites; enabling a connected multi skilled workforce.

Main Features

The main features of the WebSteering software are as follows:

- A web-based software designed to work when it is connected to a GeoGraphix server as well as when it is not.
- Ability to help geologists build a more accurate target surface that can be used to drill the next well.
- This software can also be connected to a WITSML Server. Therefore, data loaded from the rig can be directly saved to GeoGraphix.
- Easy installation.
- Technical Geosteering based on Relative Stratigraphic Depth concepts (no distortion like vertical section projection).
- Capable of converting an LAS file into a Type Log.
- Automatically calculates True Vertical Depth (TVD), Northing, Easting and Vertical Sections from MD, Inclination and Azimuth.
- Directional survey calculations and related minimum-curvature interpolations for geosteering and graphing.
- Graphic display of data with full zooming capabilities and coupling of graphs including LWD, Wellbore directional survey data, and Type Log.
- Segment addition and management.
- Display can be customized e.g. line colors, min/max scale limits, linear scale format etc.

- Has the capability to process files that have been dragged-and-dropped on the interface.
- Requires GeoGraphix® Discovery.

Benefits

The GVERSE WebSteering software offers you the following benefits:

- **Flexible**: Flexibility in the location where you geosteer a horizontal well from – in the office, at home, or in the field
- **Simple**: Simplified Data Entry for LWD and survey data using drag-and-drop or WITSML. Data is transferred into LMKR GeoGraphix projects via the web with one button click.
- **Integration with GeoGraphix**: Integration with GeoGraphix applications, including selection of type logs and gridded surfaces from the GeoGraphix database, and use of Web Geosteering interpretations in GeoGraphix to produce more accurate target surfaces.

System Requirements

The following sections list the system requirements for the WebSteering software.

Software

The software that must be installed on the system running the WebSteering software are as follows:

- GeoGraphix Discovery 2016.1.1 or 2015.1.4
- Microsoft .NET Framework 4.2 or greater
  Note: The service pack 2015.1.4 contains critical updates and must be installed in order for WebSteering to function properly with GeoGraphix 2015.1.
- LMKR License Management Tool 2016.1 for WebSteering license
  The LMKR License Management Tool (LMT) must be installed to configure the WebSteering license.
- Adobe Reader for selected help files (optional)

Note: It is recommended that you run the WebSteering software on Internet Explorer 11.x.x and Google Chrome 42.x.x.x or later.

Operating System

To run the WebSteering software, you need the Windows® 7 operating systems installed on your system.

Note: It is recommend to use the latest Microsoft service packs and security patches.

Hardware

The hardware requirements for the WebSteering software are as follows:

- Quad 2.4 GHz 64-bit Intel® class or better
- 4 GB RAM or greater
- 1024x768 graphics resolution

Licenses

The following licenses are required to run the WebSteering software:

- GVERSE WebSteering 2016.1 license
- GeoGraphix Discovery 2016.1 or 2015.1 license

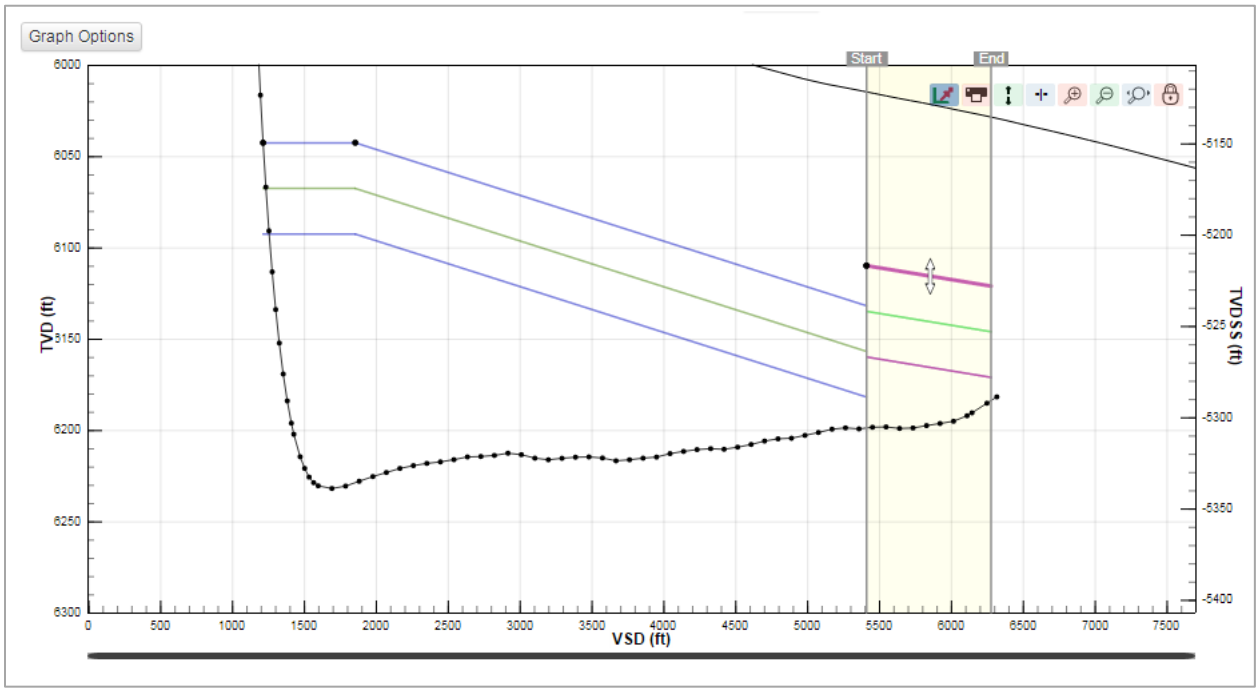
Note: Refer to the LMKR Customer Support Portal (http://support.lmkr.com/) for up-to-date information on the requirements.

New Features

This section contains a brief description of the exciting new features included in the 2016.1 release.

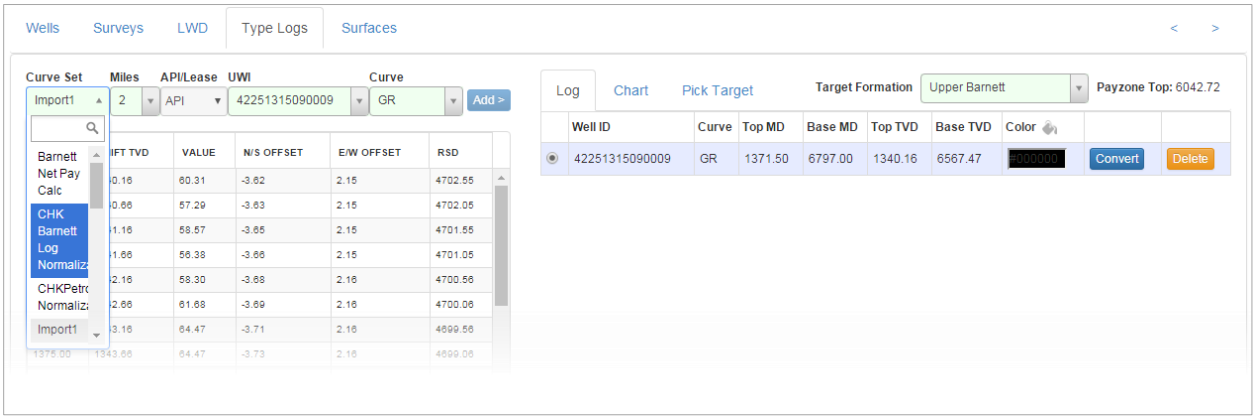
Ability to Add Faults by Moving Segments Up and Down via Mouse Control

You can add a fault by adjusting the **Start** RSD of the segment by moving the payzone top in the survey plot. To do so, hover the cursor on the selected segment, your cursor turns into a double-pointed arrow, drag the payzone top up or down at your desired depth to add a fault. This technique has been added as an alternate to the previous technique of adding a fault.



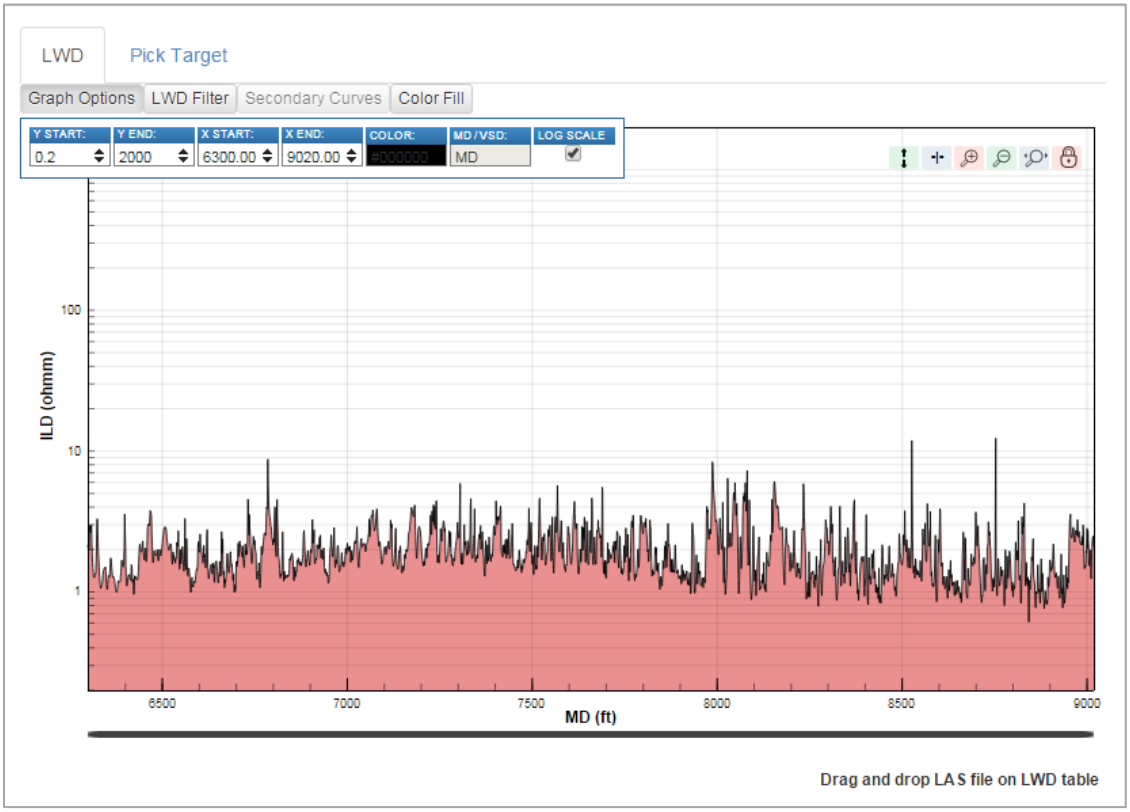
Support for All Curve Sets in GeoGraphix Project

Select the desired curve set from the **Curve Set** drop-down list on the **Type Logs** tab. The **UWI** and **Curve** drop-down lists populate only the options available for the selected curve set.



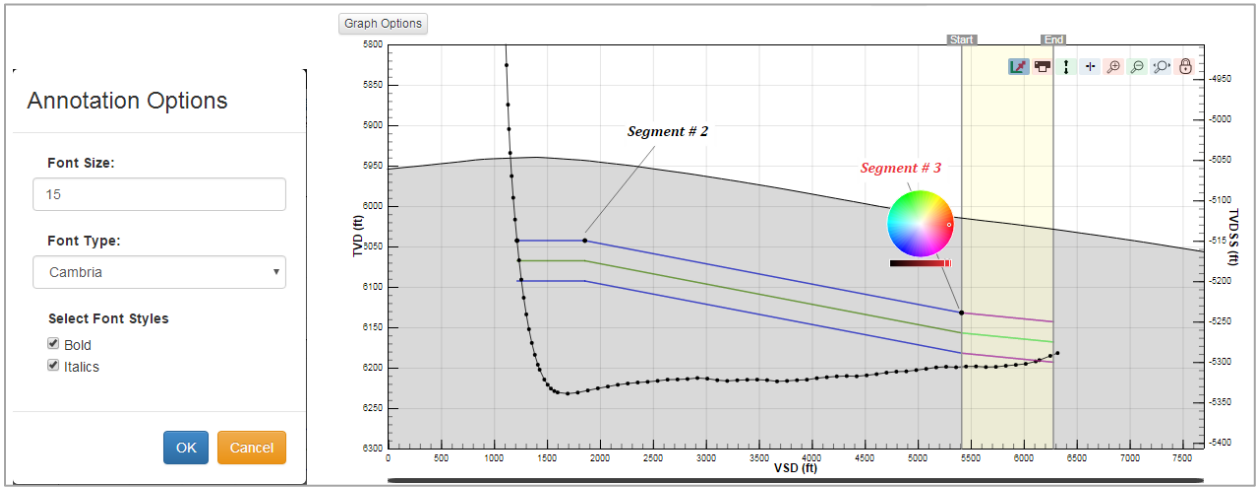
Display Curves in Logarithmic Scale

Curves can be viewed in logarithmic scale by selecting the Log Scale check box from the Graph Options menus of the LWD and Type Logs tabs.



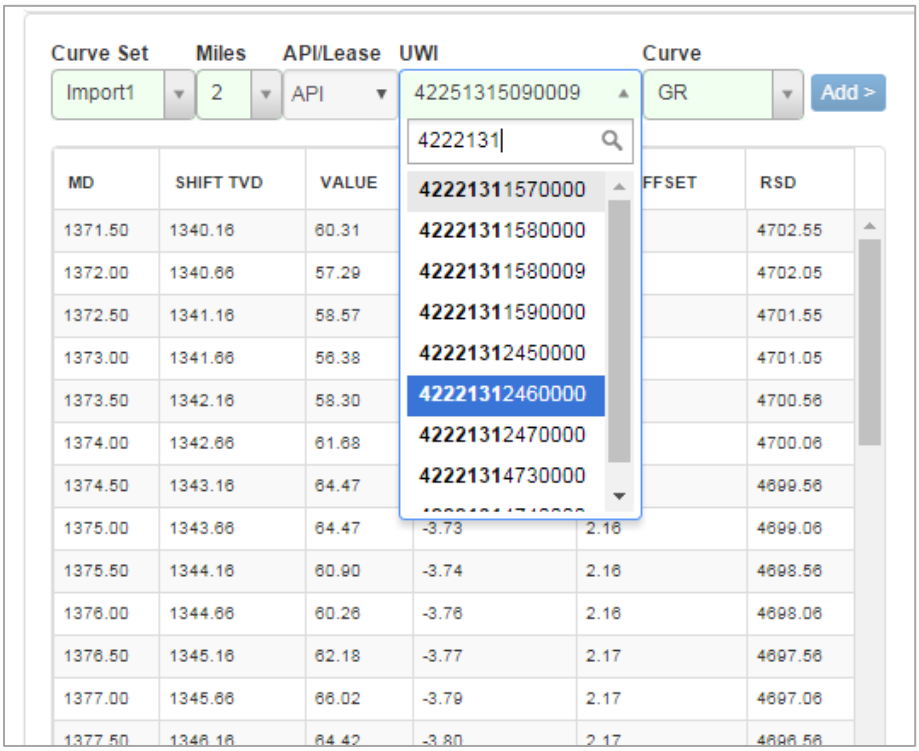
Ability to Edit Annotation Font Style, Size and Color

To edit an annotation, right-click the **Annotate** button. From the **Annotation Options** dialog box edit the font size and type of your annotation from the **Annotation Options** dialog box. To edit the font color, right-click the annotation text on the graph and select the desired color from the color palette.



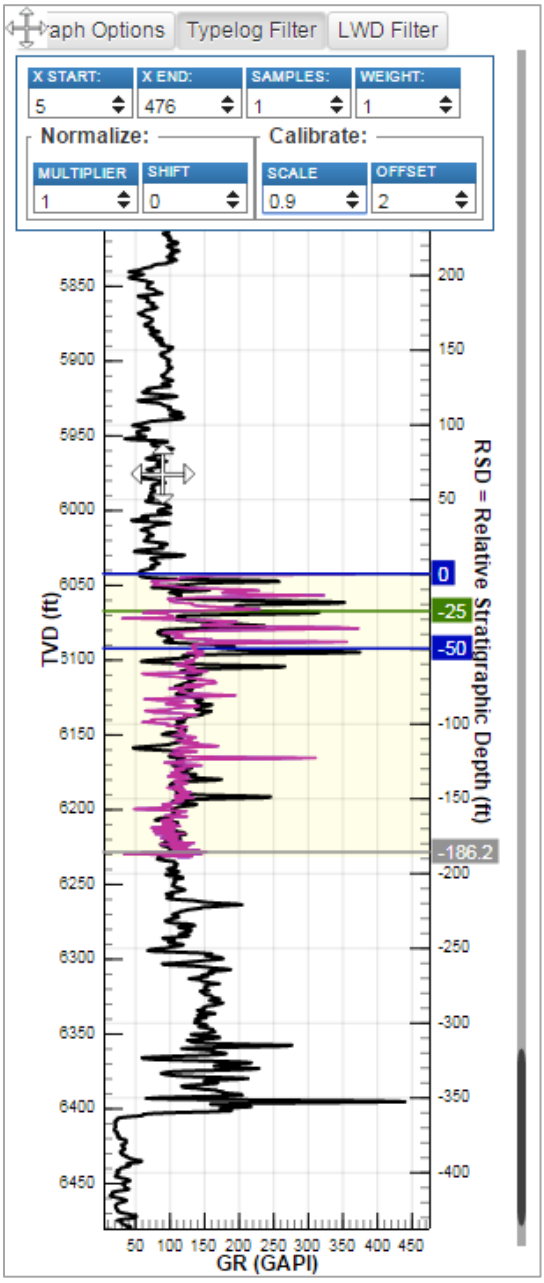
Searchable Drop-down Lists on Well, Type Logs and Surfaces Tabs

The **Curve Set**, **UWI**, **Curve** and **Target Formation** drop-down lists on the **Type Logs** tab have search boxes to search for desired items. Similarly, the **Grids** drop-down list on the **Surfaces** tab also has a search box to search for desired surfaces.



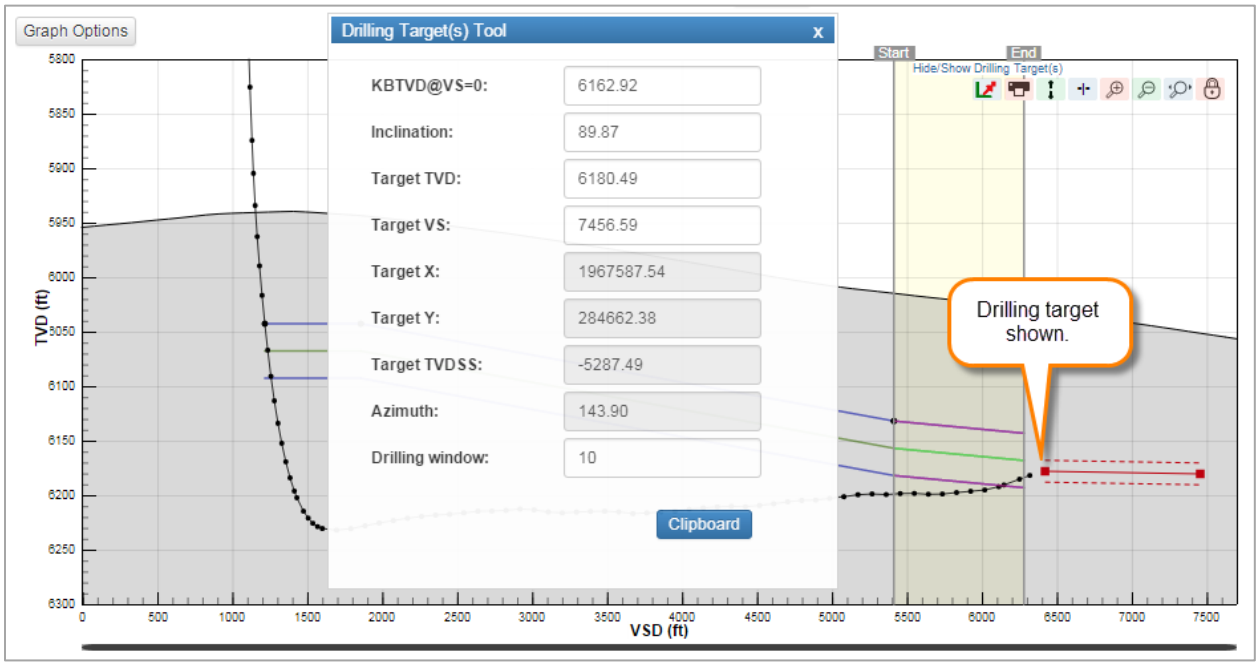
Calibration Capability for Offset Typelog

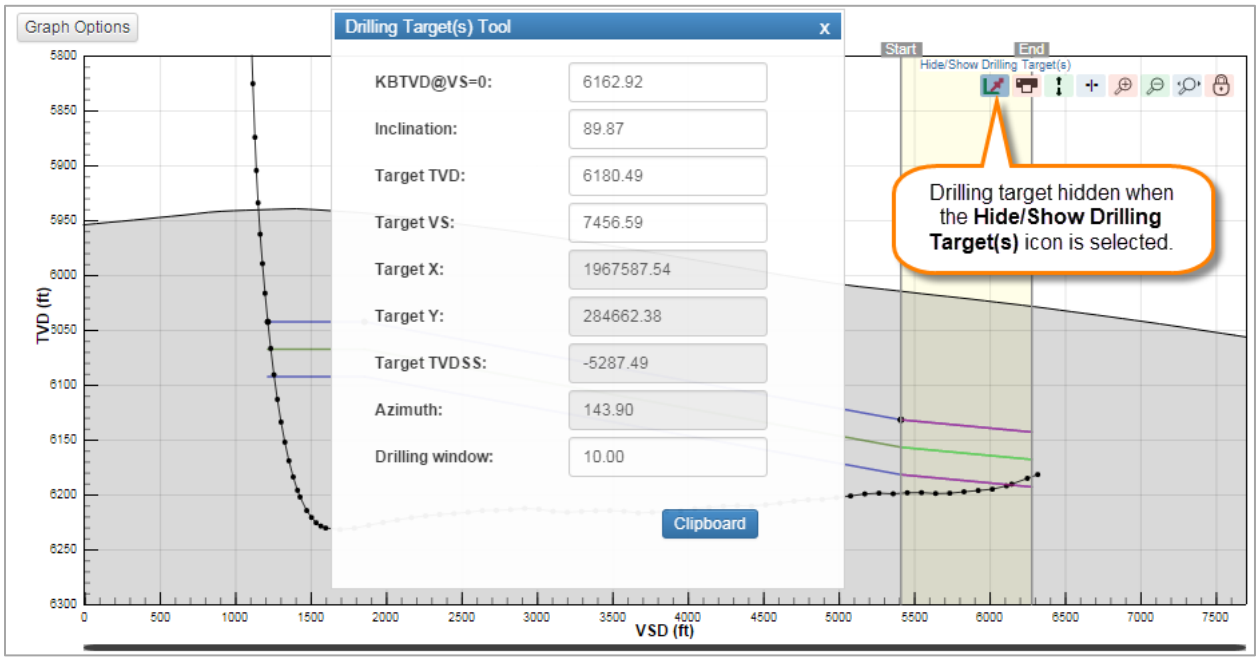
The **Toggle Calibration** icon has been added to the Correlation track of the Geosteer page. When toggled on, the calibration mode is enabled. The calibration mode allows you to use your mouse scroll button to change the value of the calibration scale and offset. When toggled off, the Calibration mode is disabled.



Ability to Show/Hide Driller's Target Lines

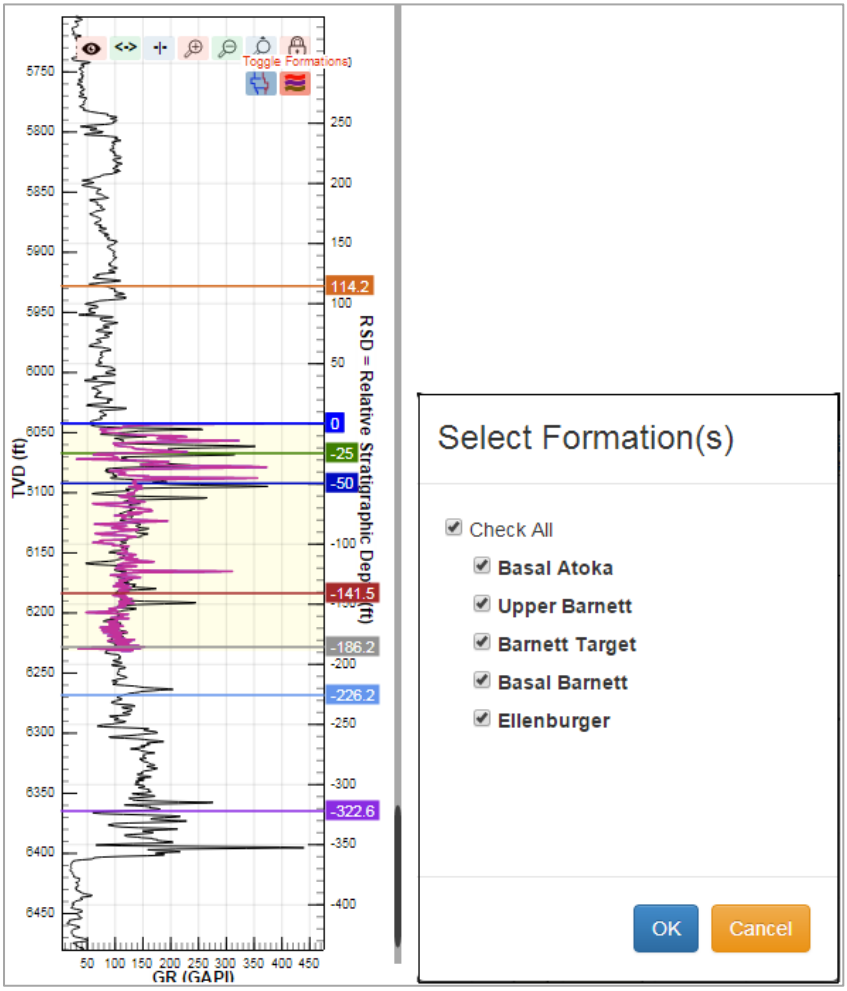
The **Show/Hide Driller's Target(s)** icon has been added to the Survey track of the GeoSteer page, when the track displays in VSD mode. When the **Show/Hide Driller's Target(s)** icon is selected, the driller's target line is hidden and when the icon is disabled the driller's target line displays.





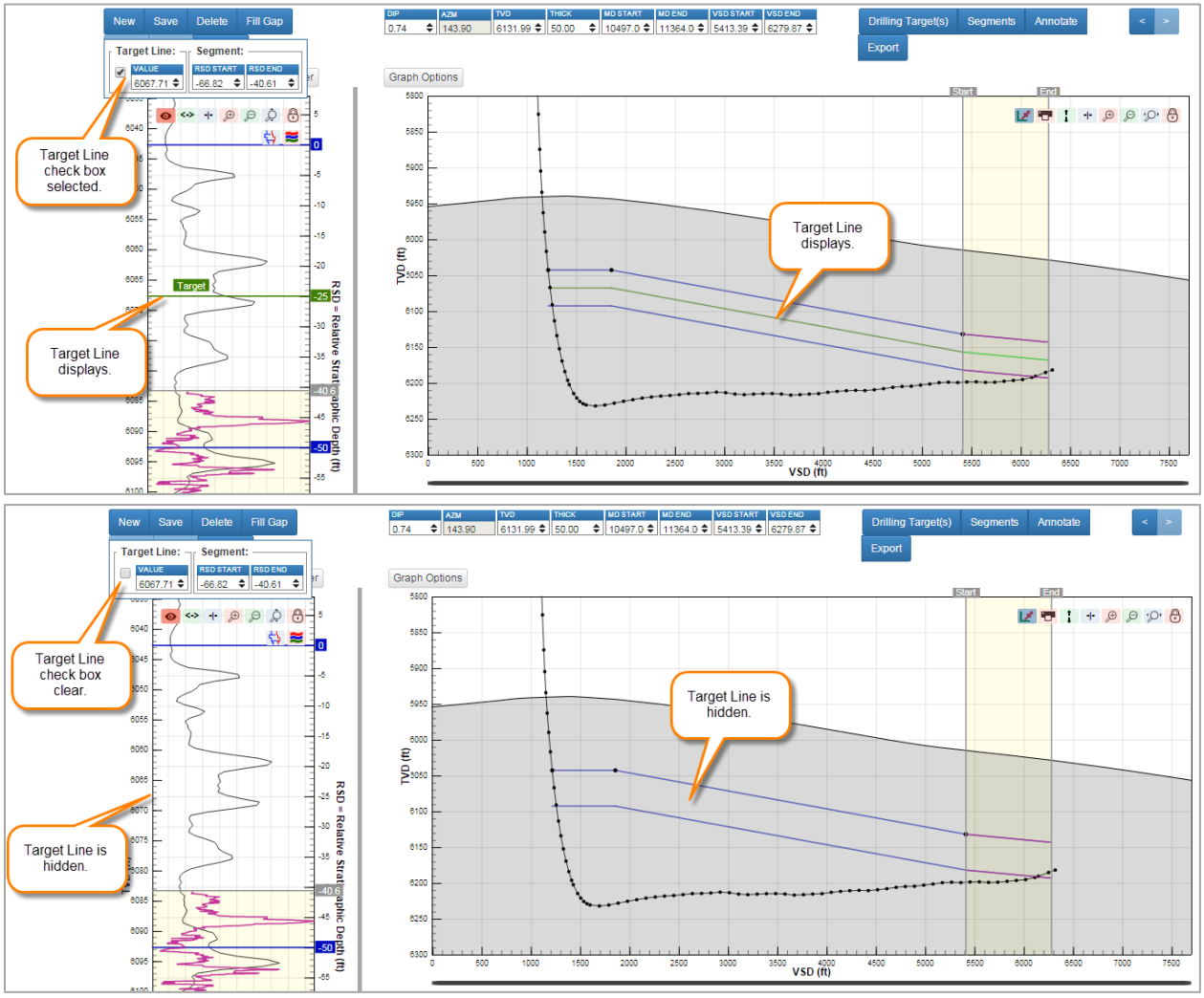
Ability to Show/Hide Formation Tops on Typelog Graph in Geosteer Page

The **Toggle Formation** icon has been added to the **Type Log** track of the GeoSteer page. When toggled on, the **Select Formation(s)** dialog box displays. You can select from a list of formations in the type log from. The selected formations display on the type log track.



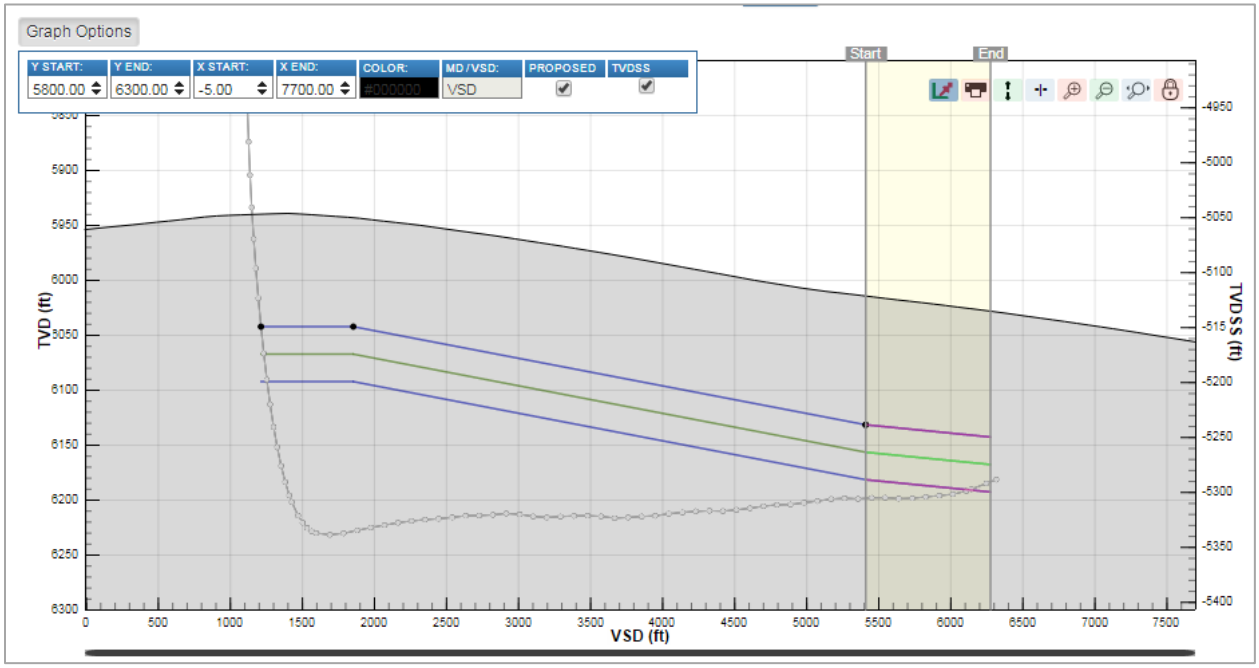
Ability to Show/Hide Payzone Target

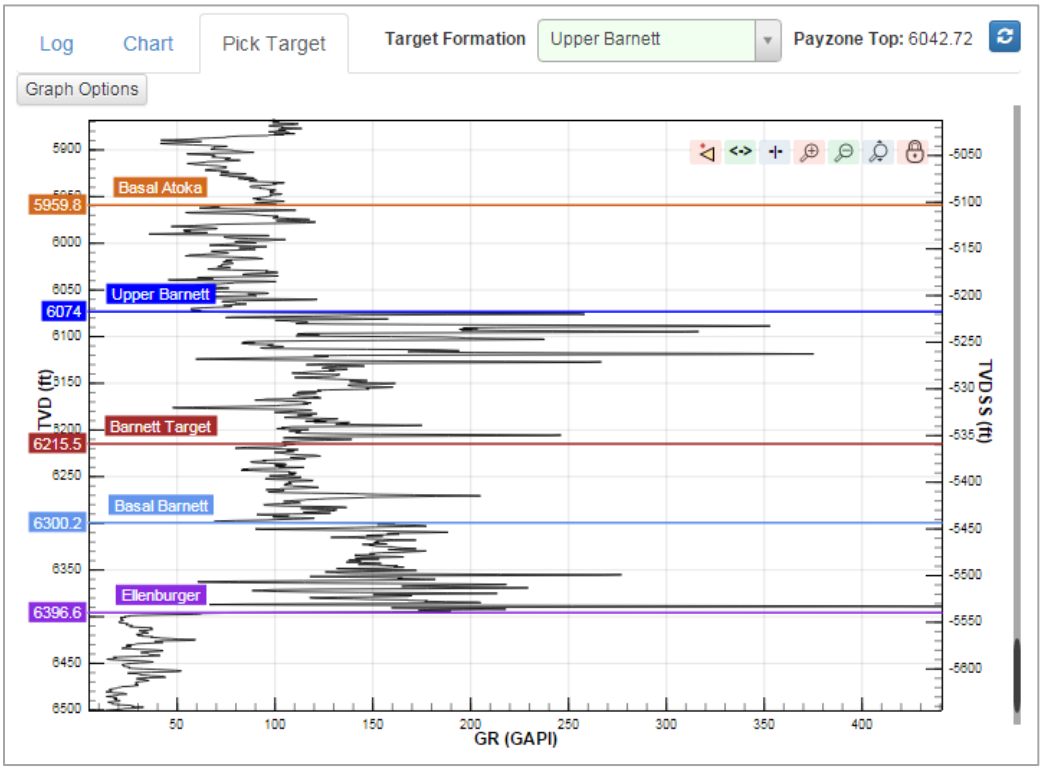
From the **Options** menu on the GeoSteering page, select the **Target Line** check box to display the target line on the survey and correlation tracks. When the **Target Line** check box is clear, the target line is hidden.



Displaying Correlation and Survey Graphs in TVD Subsea

The TVD Subsea (TVDSS) values display on the Survey and Correlation graphs of the GeoSteer page when TVDSS is selected from the **Graph Options** menu. If the changes are made on the GeoSteer page, they reflect on the dashboard and vice versa.



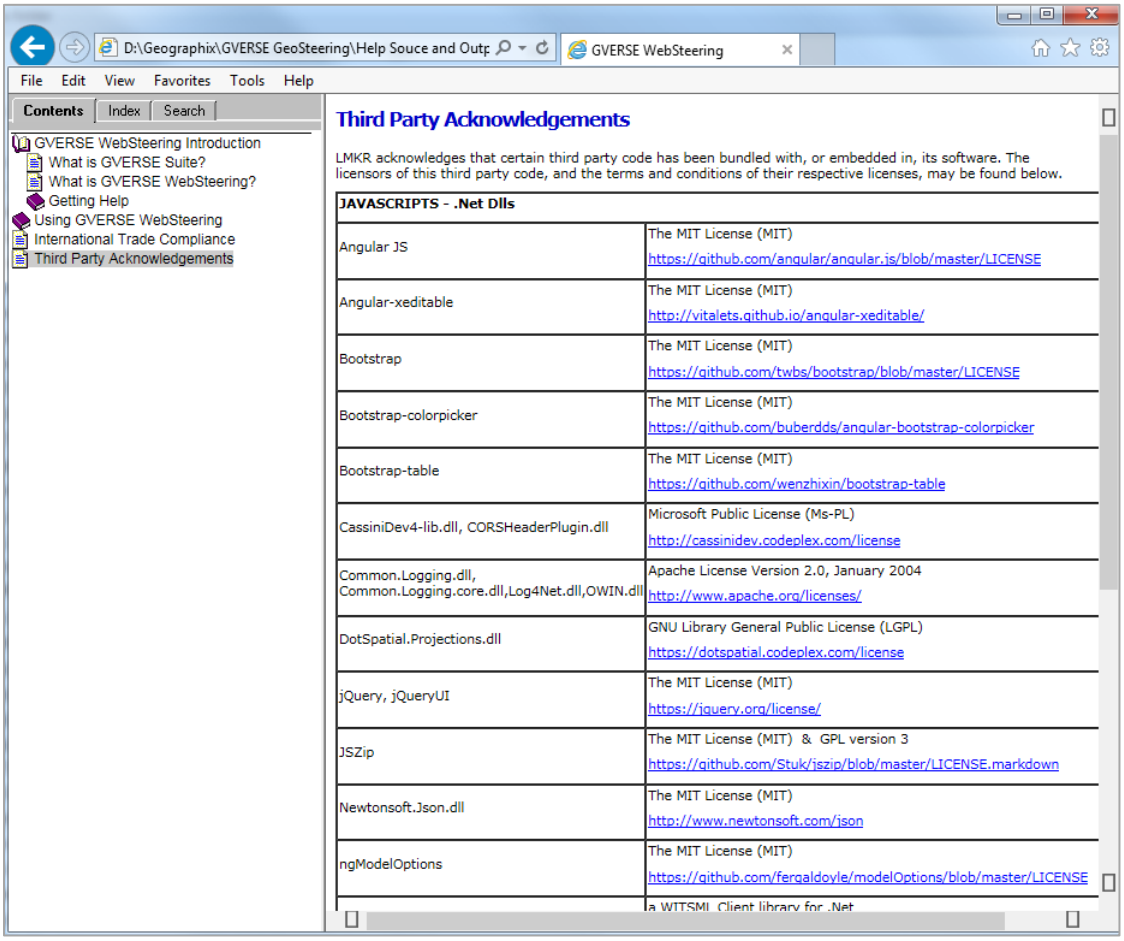


Third Party Applications

LMKR acknowledges that certain third party code has been bundled with, or embedded in, its software. The licensors of this third party code, and the terms and conditions of their respective licenses, may be found in the WebSteering software Help file.

To access the third party license agreements:

1. Click **Help** from the main menu bar.
2. Open the **Third Party Acknowledgements** help topic.



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 ECCNs provided (if available) here represent LMKR's 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 support@lmkr.com.

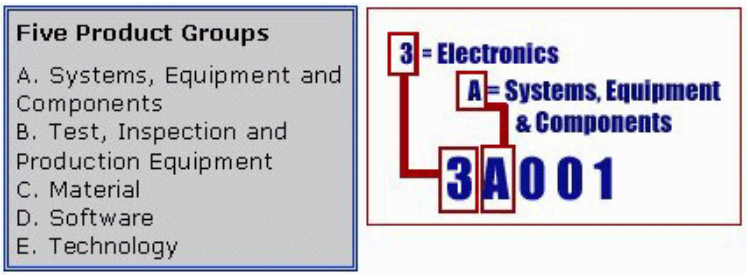
Under the U.S. Export Administration Regulations (EAR), the U.S. Government assigns your organization or client, as exporter/importer of record, responsibility for determining the correct authorization for the item at the time of export/import. Restrictions may apply to shipments based on the products, 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

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.

The following illustration is a sample:



The ECCN number (if available) and License Type for this product are included in the table below. Also included is the date the table was last updated.

Product/Component/R5000	EAR Number	License	Last Updated On
GVERSE WebSteering	EAR99	EAR	11/23/2015

Contacting LMKR Support

LMKR is committed to providing the highest level of technical customer support in the industry. With an average tenure of more than thirteen years, our highly trained and experienced staff of technical analysts is comprised of geoscientists, engineers, land professionals, petrophysicists, and system specialists.

Please refer to our Customer Support timings mentioned below to ensure that you have access to our support analysts assigned to your region. When getting in touch with LMKR support, please remember that real-time support will not be available during bank holidays or after office hours. If you do get in touch with LMKR Support outside of work hours, please leave a voice message with a brief description of the issue that you are facing. Your voice message will be used to automatically create a support case for you. This will enable our analysts to attend to your issue and provide you with a resolution as soon as possible

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Name	Website Address
LMKR Homepage	http://www.lmkr.com
LMKR GVERSE	http://www.lmkr.com/gverse
LMKR Support Portal	http://support.lmkr.com