USER GUIDE FOR THE UNCONVENTIONAL OIL AND GAS VULNERABILITY MAP

The DVD accompanying this report contains a stand-alone *Unconventional Oil and Gas Vulnerability Map* website that runs in a browser without requiring an internet connection. The website includes an interactive map browser that allows the user to explore the various datasets mentioned in this report.

HOW TO RUN THE VULNERABILITY MAP WEBSITE

Insert the DVD into your DVD drive and the Vulnerability Map website should load automatically. If *User Account Control* is activated on your computer you might get a message, or series of messages, asking whether you want to allow the program to make changes to your system. Answer yes to these questions.

You can also run the Vulnerability Map website from a USB flash drive or from your hard drive. Simply copy the entire contents of the DVD to a folder on your hard drive or onto a USB flash drive and then double-click the file *Server2Go.exe* to load the website. Note that you need to have a Microsoft Windows operating system on your computer in order to run the website.

VULNERABILITY MAP WEBSITE STRUCTURE

The Vulnerability Map website comprises three sections, namely **Home**, **Interactive Map** and **Documents**. These sections are accessible via the orange menu bar near the top of the screen.

- **Home:** This section contains an introduction to the website and also provides background on the interactive map browser.
- **Interactive Map:** This is the main section of the website where you can explore and interrogate the spatial datasets referred to in this report.
- **Documents:** Here you can download PDF versions of the report and other documents relevant to the report.

USING THE INTERACTIVE MAP BROWSER

The map browser contains a *Vulnerability Map Themes panel* on the left, the *Map panel* on the right and an *Information panel* at the bottom. There is also a popup *Overlay Information window* that appears when you click on the map.

- **Vulnerability Map Themes panel:** This panel is used to control what is shown on the map. At the top of the panel is a drop-down list that allows one of five map themes to be chosen. When a vulnerability theme is selected, the list of base maps and overlays for that theme are displayed and the map is automatically updated to show the default layers. You can then select from one or more of these base maps and/or overlays. Note that only one base map can be shown at a time whereas multiple overlays can be displayed at the same time.
  - **Map Themes:** Select a map theme from the drop-down list. Only one theme can be selected at a time.
  - **Base Maps:** To activate a base map click on the circle to the left of the base map name. Only one base map can be activated at a time.

- o **Overlays:** Click the check-box to the left of the overlay name to turn the layer on or off. When an overlay is greyed out, it means that the map has been zoomed out beyond the active zoom range for that layer. Zoom in on the map until the layer becomes active.
  - o **Base Map Legend:** The legend changes automatically whenever a new base map is activated.
  - o **Zoom to… :** You can zoom to a particular *Water Management Area*, *Quaternary Catchment* or *Town* by selecting one of these from the zoom boxes at the bottom of the Map Themes panel. The available zoom boxes change according to which map theme has been selected.
- **Map panel:** The map is a live map that can be zoomed, panned and queried. These operations can be performed as follows:
  - o **Zoom in:** As you zoom in more detail becomes visible on the map. There are a number of ways to zoom in
    - click the plus sign at the top-left corner of the map to zoom in by a fixed amount,
    - press the <Shift> key on your keyboard and then click and drag a rectangle on the map to zoom to that rectangle,
    - double-click anywhere on the map to zoom to the point you clicked,
    - place the cursor anywhere on the map and then roll your mouse wheel to zoom in.
  - o **Zoom out:** Less detail is shown on the map as you zoom out. There are a number of ways to zoom out
    - click the minus sign at the top-left corner of the map to zoom out by a fixed amount,
    - place the cursor anywhere on the map and then roll your mouse wheel to zoom out,
    - click the home icon at the top-left corner of the map to zoom to the full extent of the map.
  - o **Pan:** Click and drag the map to change the portion of the map visible in the map panel.
  - o **Query:** When an overlay is switched on, click on a map feature to display information on that feature. The two base layers in the *Surface Water* theme are also clickable.
- **Information panel:** This panel provides information on the vulnerability map theme that has been selected in the map themes panel. The contents of the panel change automatically each time a new map theme is chosen.
- **Overlay Information popup:** With one or more overlays switched on in the Map Themes panel you can click on the map and the popup window that appears provides information on features at or near the place you clicked. The two base layers in the *Surface Water* theme are also clickable. You can move the popup window around by dragging the title bar at the top, and the window can also be resized in the normal manner. The popup window can be left open and its contents will be updated every time you click on the map.

TROUBLESHOOTING

If for some reason the website does not load then there are a number of things to try:

1. **The Vulnerability Map website does not load automatically:** Open Windows Explorer and locate the file called *Server2Go.exe* on the DVD. Double-click this file to start the Vulnerability Map browser.
2. **The file *Server2Go.exe* does not run when double-clicked:**
   - Check that your computer has a Windows operating system. The Server2Go software will only run on Microsoft Windows.
   - Try right-clicking the file and selecting 'Run as administrator' from the popup menu. You might be asked to supply an administrator password.
3. **The browser opens up but the Vulnerability Map website does not load after a reasonable amount of time:**
   - Click the reload/refresh button on your browser.
   - Check on the taskbar whether there are any User Account Control messages awaiting your response.
4. **The interactive map browser runs very slowly:** Copy the entire contents of the DVD to a folder on your hard drive and run the map browser from there. Double-click the file *Server2Go.exe* to load the browser.

SOFTWARE

A number of different software technologies were used in developing this website and interactive map.

- The map browser is powered by *Server2Go*, a webserver that runs a stand-alone instance of *Apache* webserver and offers *PHP* support. Please visit http://www.server2go-web.de/ for more details.
- The website framework is powered by *PHP* (http://php.net/).
- The interactive map is powered by *MapServer* (http://mapserver.org), *OpenLayers* (http://openlayers.org) and *ExtJS4* (http://www.sencha.com/products/extjs/).

LICENSING

All JavaScript and PHP software developed for this product is released under the GNU GPL licence v3 (http://www.gnu.org/copyleft/gpl.html). A copy of this licence can be found on the DVD in the file *gpl-3.0.txt*. The licence applies to the following files:

    /root/*.php
    /root/js/map.js
    /root/js/controller/*.js
    /root/js/model/*.js
    /root/js/store/*.js
    /root/js/view/*.js

SOFTWARE DEVELOPER

GIS Solutions (http://gis-solutions.co.za)

SPATIAL DATA

The spatial data used in the interactive map can be found in the */htdocs/data/* folder on the DVD. These are in either TIFF or ESRI shapefile format and can thus be used in any GIS program. The following table provides a list of these files.

File Name	Description of Contents
boreholes.shp	Boreholes
common_cat_a_pa.shp	Prospecting & Mining Legally Prohibited
common_geol_structures.shp	Geological Structures
common_geol_structures_springs.shp	Springs
groundwater_drastic.tif	DRASTIC Groundwater Vulnerability
pasa.shp	PASA Permit Areas
quaternary.shp	Quaternary Catchments
rivers.shp	Rivers
roads.shp	Main roads of South Africa
seismicity.tif	Seismicity
socioeconomics_agriculture.shp	% of Population Employed by Agriculture
socioeconomics_astronomy.shp	Astronomy Assessment Areas
socioeconomics_astronomy_meerkat.shp	Astronomy Assessment Areas – Meerkat Receiving Stations
socioeconomics_subterranean_gca.shp	Subterranean Groundwater Control Areas
socioeconomics_ward_water.shp	% of Population Dependent on Groundwater as a Domestic Water Source
socioeconomics_wards.shp	Socio-Economics Aggregated; Population Density; % of Children Under 5 Years of Age; % of Female Headed Households
surfacewater_DEC.shp	River Condition by Default Ecological Category (DEC)
surfacewater_fish.shp	Threatened and Near Threatened Fish Species
surfacewater_wetland_clusters.shp	Wetland Clusters
surfacewater_wetland_rank.shp	Wetland Condition based on Wetland Ranks
swsa_blobs.shp	Strategic Water Sources
vegetation_ade.shp	Aquifer Dependent Ecosystems (ADEs)
vegetation_aggregated.shp	Vegetation Aggregated
vegetation_cat_b_cba.shp	Category B Critical Biodiversity Area - Bioregional and Provincial
vegetation_cat_c_cba.shp	Category C Critical Biodiversity Area - Bioregional and Provincial
vegetation_cat_d_esa.shp	Category D Ecological Support Area - Bioregional and Provincial
vegetation_cat_d_esa_equiv.shp	Category D Ecological Support Area Equivalents
vegetation_ets_pls.shp	Ecosystem Threat Status Ecosystem Protection Level
vegter.shp	Vegter's Groundwater Regions
wma.shp	Water Management Areas