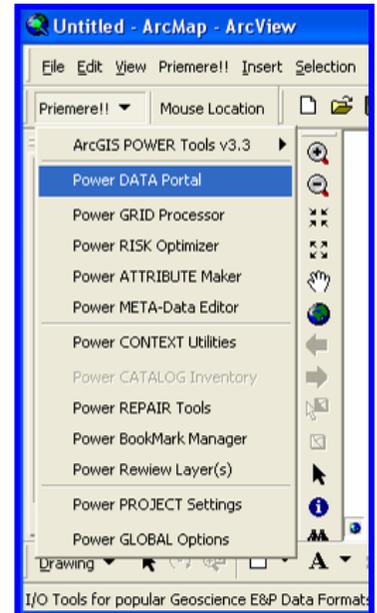
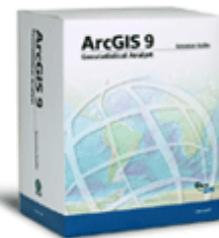


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## I) Introduction

These Power Tools are a package of Utilities developed to extend the generic functionality of the ArcGIS Desktop application. They are designed around the unique requirements of the Petroleum Exploration & Production environment, with a focus on automation and efficiency.



### A. Confidentiality

This application and technology is licensed for proprietary use. Please maintain this documentation in confidence.



### B. Documentation

Each of the individual modules is documented separately, and can be accessed via the pull down menus from the specific module. The section headers below also contain hyperlinks to the specific documents.

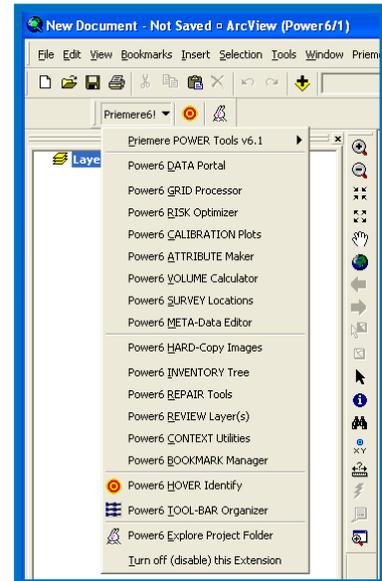
#### B.1 PDF Navigation

Note that to easily navigate through these hyperlinked PDF documents, you will want to use the controls next to the page number at the bottom of the PDF viewer, or activate the floating toolbar from the pull-down menus: View → Toolbars → Navigation.

### C. Power Extension

These tools are delivered as an extension to ArcGIS Desktop via a floating toolbar.

- ✓ **Toolbar:** the Power ToolBar can be docked as you please on the ArcGIS application frame. From the application pull-down menu, select View → Toolbars to activate or deactivate the toolbar named “Priemere POWER Tools!”
- ✓ **Menu:** the individual Power Tools are accessible from a menu on the Toolbar. It is also possible to customize the interface (Tools → Customize) and copy the menu or any of its items to another location, such as the main pull-down menus.
- ✓ **Extension:** Items on the toolbar and menu are enabled or disabled according to the state of the Extension. From the ArcGIS application pull-down menu, select Tools → Extensions to toggle the state of the “Priemere Power Tools for ArcGIS”. The last item on the Priemere menu will also do the same thing a bit easier.



### D. Something for Everyone!

This application has evolved to offer something for everyone in the company. The supported workflows, when applied consistently across the organization, have been proven to add significant value in evaluating expensive strategic decisions such as data acquisition, drilling, leasing, or equity negotiations. Repeatable, reliable, and efficient processes bring more, faster, and better information to the team, facilitating collaboration to improve analysis and results. What would it be worth to get just one percent improvement in return on these large investments?

- ♥ **GeoScience Analysis:** our flagship functionality is Play Fairway Analysis as part of a Play Based Exploration (PBE) process for either Conventional or Resource plays. The resulting “sweet spot” or “traffic light” maps can be used for Risking & Ranking at a regional, local, or any other scale. We also offer unique structural analysis to identify traps, basins, and fetch areas and then follow with Volumetric calculations for the traps. And grid for risk, structure, or anything else can be calibrated against observed data.
- ♥ **Data Access:** since the above high tech analysis can not be accomplished without Data to analyze, the most frequently used module is our Data Portal to facilitate access to data from many industry specific G&G applications.
- ♥ **Subsurface Mapping:** native ArcGIS offers a variety of gridding, contouring, and other grid manipulation functionality, which we have taken that to the next level by packaging to facilitate batch processing and common G&G work flows.
- ♥ **Visualization:** our cross-section viewer fills a significant void to compliment the excellent 2D (ArcMap) and 3D (ArcScene) visualization already available in ArcGIS. And our various utilities help improve the quality and utility of existing maps.

- ♥ **Technical Support:** routine, mundane, but very important tasks such as loading data, publishing results, and generating PowerPoint slides have been automated and made available to the less experienced GIS User.
- ♥ **IT Administration:** data management is simplified with our tools for managing metadata, tracking ancestry & lineage, scanning a Catalog, reporting on problems, and repairing those problems.
- ♥ **Executive Management:** every part of this application is designed to facilitate Batch Processing that is repeatable, reliable, and efficient. Not only will management get the desired results on a timely basis, but the ability to quickly iterate will greatly improve the quality of those results!

## II) Group 1: Generate Data

The first menu group contains the most significant tools, which all generate new GIS data.

### A. [Power DATA Portal](#)

This application facilitates exchange of data in a wide variety of formats, with particular focus on the software applications and formats frequently used by GeoScientists in the E&P industry. In our complex work environment, integration is always an issue, and these tools will help you get the data you need in and out of ArcGIS. Power functionality includes auto-detect of file type and format, drag-and-drop enabled, and batch processing of multiple group selections.

### B. [Power GRID Processor](#)

This module will provide powerful automation tools for processing batches of grid (raster) data. Functionality includes interpolation, thickness calculations, batch contouring, drainage analysis to locate trap polygons and catchment areas, and volumetric calculations. Each of these features will operate efficiently on a batch of grids in your ArcMap Table of Contents (ToC) to save you many hours of repetitive operations.

### C. [Power Risk Optimizer](#)

This module will automate the process of analyzing spatial variation of Risk to optimize the selection of locations or hi-graded areas. The simple user interface will allow you to generate individual risk maps (grids) by applying cutoff values to any type of input data: grids, polygons, lines, or points. Then a variety of statistical methods are available for convolving a series of individual risk elements to generate the composite risk grid and related grids. Any number of individual risk elements can be employed, and model parameters are saved to allow for easy revisions or updates.

### D. [Power CALIBRATION Analysis](#)

This module will facilitate the process of calibrating a surface to observed data using rigorous statistical methods for conformable, proportional, or logistic (Bayesian) gridding. For example, risk results calibrated to well success/failure or depth grids calibrated to well tops. The interactive display will show each observation with the corresponding surface (grid) value, a

predicted value, a variety of statistical measures to analyze the results, and options to omit from the analysis. Output results will be a new calibrated grid and other QC layers.

#### **E. Power ATTRIBUTE Maker**

This module provides a simple user interface to create & populate attribute fields for an ArcGIS feature class (such as prospect polygons) by extracting values (text or numeric) from other ArcGIS layers: either raster (grids) or features (polygons, lines or points). Power functionality includes batch processing for any group of attributes, and the ability to save settings to a parameter file to modify or update in the future.

#### **F. Power VOLUME Calculator**

This simple tool will automate the process of calculating Volumes for a stack of target horizons. Containers can be segmented and/or sub-totaled as desired, evaluated for as many sensitivity cases as needed, and split according to ownership positions. Results are a series of 3d enabled polygons with attributes that can be tabulated and summarized as desired.

#### **G. Power STRATIGRAPHIC Model**

This module will process a group of grids to generate a fully interpolated and conformable structure model for basin modeling and various other purposes. Time transgressive salt intervals can be used to generate polygons of salt penetration for each stratigraphic horizon. And additional QC output includes Thickness and Confidence grids, as well as Truncation polygons.

#### **H. Power SURVEY Locations**

This simple tool will automate the process of locating points (i.e., wells) with survey footage calls from polygon (i.e., Section) boundaries. The output will be a new point feature class with additional attributes for EW and NS location calls.

#### **I. Power METADATA Editor**

This module will facilitate easy viewing or editing of metadata for data objects in any ArcGIS desktop application (map, catalog, scene, or globe). MetaData is vitally important to keep track of the masses of data that can be produced, as well as providing options for searching, cataloging, and archiving data. This tool will expose a high-graded suite of attributes that are preferred for ease of use in our environment, as well as the complete ancestry of processing steps performed with our Power Tools.

---

### **III) Group 2: Manage Info**

The second menu group contains frequently used tools, which do not generate new data, but help to manage existing data.

#### **A. Power HARDCOPY Export**

This module simplifies, automates, and enhances the options for generating hardcopy images for use in popular applications such as PowerPoint. Batch functionality with automated layout can facilitate creating a Montage of images, or a map catalog from a feature layer.

**B. Power INVENTORY Tree**

This tool provides detailed information about the contents of the selected ArcGIS layers or documents (MxD, SxD, or GxD) to supplement what is available in the ArcGIS Catalog or Table of Contents. The inventory is presented in a series of linked tree views with additional functionality to help repair common problems such as Broken Links and wrong or missing Spatial Reference.

**C. Power REPAIR Tools**

This module provides tools to help repair some of the common problems that are encountered with ArcGIS, including broken links and wrong or missing spatial reference. These might be used in conjunction with the Arc Catalog tools that can search a large data library to identify and list these types of problems.

**D. Power REVIEW LAYERS**

This module will help you to easily review a map layer by scrolling through individual features or panels. Using the scroll buttons, you can systematically advance through the selected layer, zooming the map view to each selection.

**E. Power CONTEXT Menus**

This custom menu provides powerful utilities to operate on selected item(s) in the ArcGIS table of contents (ToC), as well as all relevant descendants in the tree. This functionality assists in working with complex documents and hierarchical ToC as are commonly generated with batch processes in our other Power Tools. Features include cleaning entire branches, managing group visibility & symbology, making common grid legends, and generating power point slides.

**F. Power BOOKMARK Manager**

This module provides tools to help manage bookmarks in ArcGIS Desktop documents: Map (\*.MxD), Scene (\*.SxD), and Globe (\*.GxD). With this simple user interface you can view, sort, rename, modify, or delete bookmarks, as well as import and merge bookmarks from other documents of the same type.

**G. Power CATALOG Inventory**

This module provides tools to manage a library of GIS data from Arc Catalog. These powerful tools can search the library for problems such as broken links, missing projection (spatial reference) or inadequate MetaData. The results are stored in a GeoDatabase which can then be used to report, interrogate, or repair these problems.

---

**IV) Group 3: Launch Tools**

This menu group, visible as a secondary menu from the primary menu, contains less frequently used tools

**A. [Power HOVER Identify](#)**

This tool will enhance the feedback of the Mouse Location in the Status Bar at the bottom of the ArcMap frame. When activated, the map coordinates will be displayed in a more digestible scientific format (with commas and exponents). Furthermore, if a raster grid is selected when the tool is activated, the grid index and value will be displayed. Like any other tool, it is deactivated only when a different tool is activated from any other toolbar.

**B. [Power XSECT Viewer](#)**

This simple but powerful tool will display cross-section views of various data along a specified transect in the map view. Both raster (grid) and feature (polygon, line, and point) data types can be selected to display in separate panels of the cross-section window. The transect location can be interactively modified or dragged through the map view, and multiple transect profiles can be displayed simultaneously. The Layout form will control the selection of layers for display, their grouping into Panels, and other display attributes.

**C. [Power Geodetic Assistant](#)**

Stop making basic positioning mistakes! Spatial reference and datum transformations can be quite complicated, and getting it wrong can result in minor positioning errors (in the order of hundreds of feet or meters) that are difficult to detect, but with significant adverse effects. This extension will alert you when potential problems are observed, and provide an interactive form to review additional details to diagnose the issues and assist in taking corrective action.

**D. [Power TOOLBAR Organizer](#)**

This module will help you find and toggle toolbars from an easy to organize tree structure. The tree structure is available in two modes: as a tab on the Table of Contents to easily toggle visibility, and as a separate user form with additional options for organizing and saving the tree structure.

**E. [Power EXPLORE Project](#)**

This simple tool will open Windows Explorer at the current ArcGIS Project, defined as the directory containing the active Map Document or Catalog selection.

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**V) Group 4: Settings****A. [Power RECENT Selections](#)**

This module facilitates selection from a list of recently used items in a variety of context, most notably for finding the desired ArcGIS document from a history of recent selections. In addition to populating a scrollable list for review, the form offers metadata and other additional details to help interrogate the options.

**B. [Power PROJECT Settings](#)**

This module provides tools to help manage GIS Project settings. With it you can explore the tree structure of the project folder, reset various remembered paths to the current project path, and reposition remembered popup positions.

**C. [Power GLOBAL Options](#)**

This module provides options to control the default settings used by other modules in the Power Tools, such as checking new data layers, or applying default raster symbology.

**D. [Power Update Manager](#)**

This simple utility can be used to manage updates and versions of our Power Add-In. The User can open this tool to switch between different versions of the extension. And they can specify settings for automatic updates.

**VI) Group 5: Documents****A. [Power CONCEPTS](#)**

This document outlines some of the basic concepts involved in the design of these Power Tools for ArcGIS, as well as some of the generic widgets that are used repeatedly in the application. A good knowledge of these concepts will help understand and fully utilize the functionality of these Power Tools.

**B. [Power ENHANCEMENTS](#)**

This document provides a general overview of the continuous improvement to our software. We do our best to try to keep pace in the race with the growing demands of our customer base.

**C. [Power TUTORIALS](#)**

This document outlines a series of Tutorials to become familiar with these Power Tools for ArcGIS. The objective is to provide a sample dataset and documented exercises that you can work either on your own, or in a group workshop.

**D. [Power WORKFLOWS](#)**

This document outlines a suite of more detailed Work Flow documents. These are designed to help guide you through some of the more complex processes using these Power Tools for ArcGIS that are unique to the E&P GeoScience environment.

**VII) Configuration****A. Requirements**

	<b>Required</b>	<b>Recommended</b>	<b>Other</b>
Software	ArcGIS Desktop	Spatial Analyst Extension	Version 10 released 3Q10

	version 9+	.Net Support	
Hardware	Standard Windows Computer	2.5 Ghz Dual Processor 2-4 GB of RAM	Dual screens are helpful. Win-7, 64 bit, lotsa RAM!
Skills	An open mind for Learning	Basic understanding of ArcGIS	GeoScience & Mapping Experience

## A.1 Site Information

Click on [this hyperlink](#) above to obtain additional information specific to your site.

## B. Installation

This is a fairly small and light application, and should be fairly quick & simple to install. The footprint is about 12 MB, mostly documentation, and only about 3 MB of application (DLL) files. Contact your support staff or application champion for additional information, including the network path to access these files.

There are three possible installation processes, with the newer Arc10 Add-In much easier than the legacy processes that involved administrative access to the Windows Registry.

### B.1 Arc10 Add-In

Once you obtain our file with the “.esriAddIn” extension, simply double-click to run the “ESRI ArcGIS AddIn Installation Utility” which is new to ArcGIS version 10. Thereafter, use our Power Update Manager to facilitate installation of upgrades.

From ArcMap, open the Add-In Manager from the Customize menu, and notice the two categories for Personal (My) and Shared Add-Ins. From this interface, you can delete undesired add-ins.

Note that any older releases of our add-in must be Deleted from this menu to avoid conflicts. And likewise, any versions installed through the Windows Registry (see below) must also be uninstalled.

### B.2 Windows .Net Application

Version 6 and subsequent releases of our software are based upon the microsoft.net architecture, and thus use the “.net” nomenclature.

Check with your site representative for installation instructions. They may have packaged for distribution with a deployment system such as Altiris or Marimba. Otherwise, our normal installation process is via a script found in the installation folder

```
. . .\Power_Tools.Net\01_Register.bat
```

Note that with Windows 7 or Vista you must right-click on the BAT file and select “Run as Administrator”. The result should be installation into the folder at

```
C:\Program Files\Priemere\Power_Tools.Net
```

### B.3 Windows Com Application

Prior to Version 6 our software was based upon the Microsoft.com architecture. These versions are only compatible with ArcGIS v9, and rendered obsolete with v10.

Check with your site representative for installation instructions. They may have packaged for distribution with a deployment system such as Altiris or Marimba. Otherwise, our normal installation process is via a script found in the installation folder

```
. . .\Power_Tools\01_Register.bat
```

Note that with Windows 7 or Vista you must right-click on the BAT file and select “Run as Administrator”. The result should be installation into the folder at

```
C:\Program Files\Priemere\Power_Tools
```

### a) **Uninstall**

To uninstall and/or re-install the Power Tools, simply exit all ArcGIS applications, and run the following script that has been copied to the local hard drive

```
C:\Program Files\Priemere\Power_Tools\02_UnRegister.bat
```

```
C:\Program Files\Priemere\Power_Tools\01_Register.bat
```

## C. **Site Location**

Use of our application will require an environment variable pointing to the network path that we refer to as the client “Site”. This should be handled in the above installation processes. However, if there are problems, you might need to set manually.

From the Windows start button, select Start → Control Panel → System. Then select the Advanced tab, and the button for Environment Variables. You will need a Variable named “Priemere” with the value set to the network path to your internal “Site” location. This path can be provided by your site representative, and should be a folder containing a sub-folder named “License”.

## D. **Contacts**

These utilities are provided by Priemere GeoTechnology, LLC. For more information, please visit our web site at: <http://www.Priemere.com/GIS>



Feel free to contact members of our team in Houston directly:

- Rich Priem                      281-451-8818                      [Rich@Priemere.com](mailto:Rich@Priemere.com)

## VIII) **Evolution**

Here are some notes on the development of this product. The above document of [POWER ENHANCEMENTS](#) provides more specific details, as well as information about other enhancements that are being considered for continuous improvement.

### A. **Old Testament: ← 2008**

Our biblical journey leading to this Product evolved from experience during long-term Consulting Service Projects with several key clients; primarily Exxon, Amoco, and BP.

## **A.1 Genesis (1988-2004)**

The concepts for this application came together as the confluence of our work with mapping, grid manipulation, depth conversion, and risk analysis.

- ✓ 1988-91, LOMS: Land Ownership Mapping System
- ✓ 1991-95, Sas3dM: 3d velocity model to facilitate sub-salt imaging.
- ✓ 1995-99, OmniDepth: velocity database and depth conversion application.
- ✓ 2000-04, Play Fairway Analysis: extension of OmniDepth functionality.

## **A.2 Exodus (2004-08)**

The early evolution of this ArcGIS application was as proprietary client development project to package functionality previously delivered as Consulting Services.

- ✓ 2004: R&D Prototype
- ✓ 2005: V1 Development Release
- ✓ 2006: V2 Beta Release
- ✓ 1Q07: V3.0 Demo Release
- ✓ 4Q07: V3.2 Production Release
- ✓ 1Q08: V3.3 Enhancements

## **B. New Testament: 2008 →**

The biblical journey continued with broader uptake in the E&P Industry and an accelerated development cycle and release schedule.

### **B.1 Commercial**

Initial Efforts focused on marketing & delivering to a rapidly expanding list of clients.

- ✓ 3Q08: V3.6 Commercial Release
- ✓ 2Q09: V4.0 Stabilisation
- ✓ 4Q09: V4.5 Beta Release
- ✓ 2Q10: V5.0 Production Rollout
- ✓ 3Q10: V5.1 Maintenance Patch
- ✓ 4Q10: V5.2 Maintenance Patch
- ✓ 1Q11: V5.3 Maintenance Patch

### **B.2 Professional**

Having stabilized a commercial client base, the next wave of efforts focused User Training and the Professional Quality of the Product.

- ✓ 2H10: Migration to Windows .Net Architecture
- ✓ 1Q11: V6.0 Beta Release
- ✓ 3Q11: V6.1 Maintenance Patch
- ✓ 4Q11: V6.2 Maintenance Patch
- ✓ 2Q12: V7.0 Add-In Release
- ✓ 4Q12: V7.5 Mid-cycle Update