Creating and Organizing New MARPLOT Layers

MARPLOT, as included in LandView, comes with many layers of information—topological files of roads, railroads and rivers, boundary files for selected levels of Census geography, locational files of places included in the Geographical Names Information System and the physical locations of U. S. EPA regulated facilities. However, the ability to create and use new layers of geographical information of a user's own choosing markedly extends the functionality of the application.

First, let us examine two concepts—MARPLOT Maps and MARPLOT Layers. For each we will give two definitions . . .

> A MARPLOT map as viewed on screen is the smallest rectangle, defined by latitude and longitude, that will contain all features assigned to the map. A map defining the State of Pennsylvania would touch the left and right of the display screen. A map of Illinois would touch the top and bottom of the screen.

> As computer data available to MARPLOT, a map is a directory that contains a *name.map* file. If this directory is nested in the same directory and at the same level as the *marplot.exe* executable file, the map is immediately available to MARPLOT. Otherwise, MARPLOT needs to be provided with a path statement. LandView provides this statement with the *marplot.vnx* file. Users can point to new maps with the **Find New Map** button located in MARPLOT's **List/Map List . . .** dialogue.

> A MARPLOT layer is a container for MARPLOT map objects—normally points, (poly)lines and polygons, but a layer can contain circles, rectangles and text. A layer can be displayed independently of other layers or in conjunction with other layers to provide additional context. Normally, objects on a layer are associated by a common theme.

> As computer data available to MARPLOT, layers are defined by one or more sets of three similarly named files contained in one or more MARPLOT map directories. Generically, these files are *name.lyr*, *name.obj* and *name.sum*.

A map can contain many layers—the Census map contains layers representing each layer of Census geography. The same layer can be contained on many maps—each County map in MARPLOT contains a Roads layer. It is not necessary for a map to contain layer files—a map directory with a *name.map* file is still a map though it contains no layer files. A layer need not contain any map objects—MARPLOT independently tracks available layers and available maps. As new map objects are created, they must be assigned to both an available layer and an available map. MARPLOT has no prohibition against mixing types of map objects on a layer. The same layer can contain a mix of points, polylines and polygons.

While new map objects can be added to existing maps and existing layers, it is generally not good practice to edit the data of others. New data should be assigned to new layers and/or new maps. MARPLOT contains a **User's Map** designed specifically to contain new data. A simple method for creating new maps will be discussed later in this article. First, let us address the creation of a new layer . . .
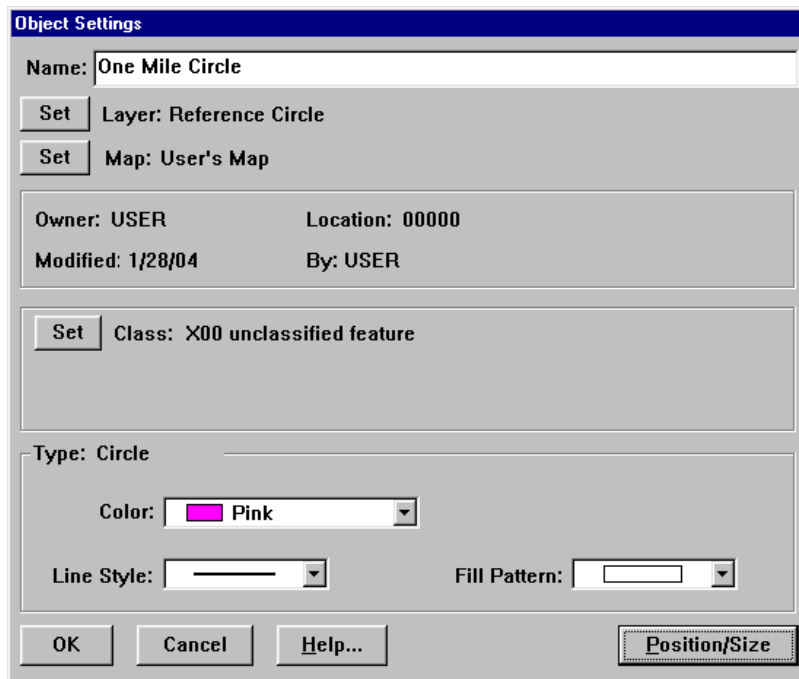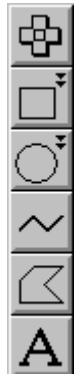
Creating a New Layer

In MARPLOT's **List/Layer List . . .** , a **New . . .** button has dual functionality—it allows creation of either a new layer or a new group[1]. We will illustrate the process by creating a layer containing a Reference Circle[2]. The dialogue box is displayed below.
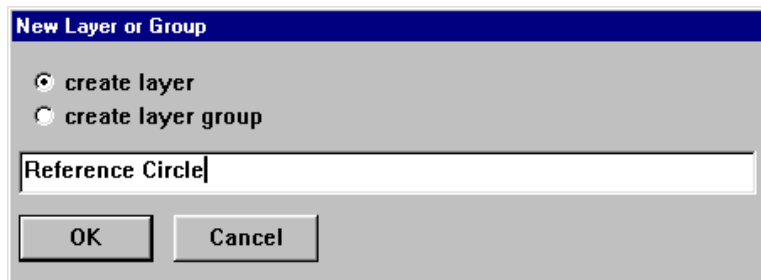
On **OK**, a new layer, Reference Circle, appears in the Layer List in **unlocked** mode. New map objects can only be added to an unlocked layer. On returning to the MARPLOT display window, a set of map object drawing tools becomes available in the left margin, as displayed below.

Respectively, they are Point, Rectangle, Circle, (Poly)line, Polygon and Text. Since our objective is to create a reference circle, we need to select the Circle tool. Previously, we should have identified the location of the center point of the circle[3]. First, click on the Circle tool and, then, on the location of the map point. The circle needs to be drawn out to the desired radius, as displayed at the foot of the screen. On release of the mouse, a Map Object dialogue box opens that requires entering formatting information.

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[1] As new layers are created, it is good practice to assign them to either an existing Group or to create a new group to contain them

[2] A Reference Circle can clarify other related information. For example, if we identify the population at a radius around a map point, a Reference Circle would identify road and river networks related to the population study.

[3] Techniques for plotting to a point in MARPLOT are not subjects of this article. Other Help files and the LandView Tutorial provide discussion.

We will call the object, "One Mile Circle". Since only the new Reference Circle layer is unlocked, the name displays by default. If other layers were unlocked, a choice would have to be made. By default, the object is assigned to the User's Map. We can now set the display attributes of the object; we have selected pink, a double-weighted line style and an empty fill pattern. It is not necessary to exercise extreme care when drawing the circle on the map; both the center point and radius can be adjusted by using the **Position/Size** button to open a new dialogue box, displayed below.

A More Complex Example

Let us say that you are a Company Environmental Manager tracking data for a number of plants across the country. You have several datasets—the locations of your several facilities, the end point distance for worst case scenarios relating to the accidental release of several chemicals in inventory at these facilities (these will become the radii for Circles of Vulnerability relating to the chemicals), end point distances for alternates release scenarios relating to these same chemicals, and the locations of environmental receptors (schools, hospitals, etc) that would cause special concern in the event of an accidental release.

There are a number of ways that the data can be displayed in MARPLOT, and informed users can elect different methodologies. For example, each dataset can be assigned to its own layer. However, a more practical approach might be to create individual layers for each plant and assign all data relating to the plant to the same layer. We will illustrate.

We will create three layers—Plant A, Plant B, and Plant C. Each facility has a worst case scenario and an alternate scenario for SO2 gas, for Chlorine and for Ammonia. For consistent object identity, we would say, e.g., Worst Case SO2, Alternate SO2, etc. Since the environmental receptors will be identified by their geographical locations, we need only say St. John's School, Central Hospital, etc.

After the layers are created, it would be useful to group them under a new Group—**Company Facilities**[4]. The remaining data is plotted to the appropriate layers. For visual recognition, Worst Case Scenarios could be assigned the color, pink, and Alternate scenarios assigned the color, green. A number of symbols are available as MARPLOT fonts for identifying types of environmental receptors.

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[4] One benefit of grouping layers is that alphabetically disparate layers are brought together instead of being scattered throughout the layer list.

Creating a New Map

By default, all new map objects are assigned to the User's Map. This may be entirely appropriate, but, if other, unrelated, objects are also assigned to this map, their presence can complicate some MARPLOT searches. There are several methods for creating new maps, but the following method is particularly easy.

We will create a new map called "Company Facilities", as follows. Any map object in MARPLOT—point, line or polygon— can be placed in **Select** mode by mouse clicking. Using **File/Export . . .** , **Export** the object in **Simple Point Format**.
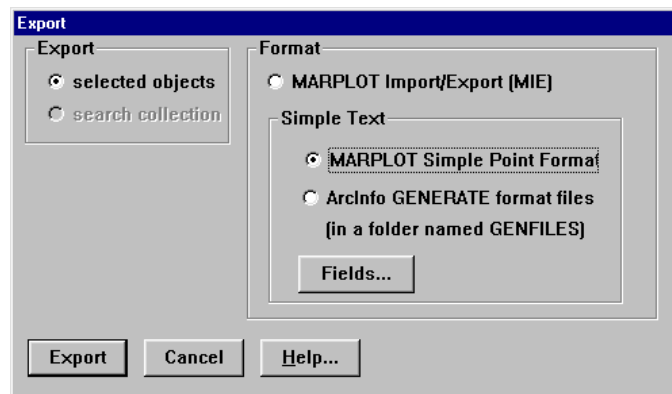
An Export file in Text format is created at a user designated location. Edit the file with a text editor. For PCs, WordPad is suggested, as it contains a number of text formatting capabilities, yet it retains the required text structure. The output file appears as below:
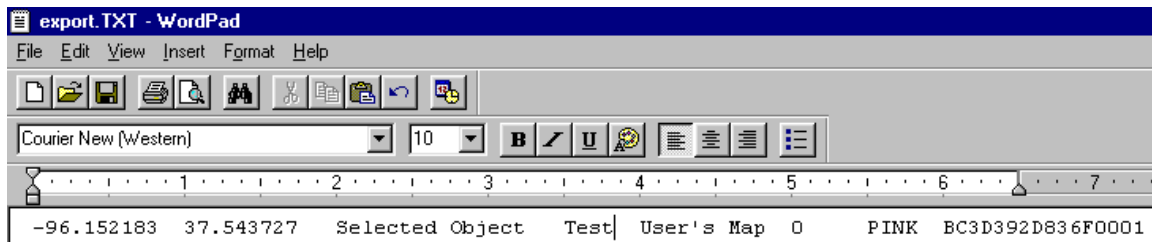
The first and second entries refer to the longitude and latitude of the object centroid. The third entry is the object name; the fourth, its containing layer; the fifth, its containing map. The last three entries are display and ID entries and can be ignored. Replace the Object name with "Object", the layer name with "Test" and the map name with Company Map.

On re-importing into MARPLOT, a new layer called "Test" is created on a new map called "Company Map". Using **List/Layer List . . .** , delete the new layer called "Test". This also deletes the unwanted new map object, but leaves an available new map directory nested in the directory containing the *marplot.exe* executable file. This is the map directory that should be used in creating the new layer objects.

Using the New Data

Effective use of MARPLOT data requires appropriate selections when using **List/Search . . .** in MARPLOT. We will present several examples, but, first, a principle . . .

Every MARPLOT search is for one or more objects on one or more layers of one or more maps.

The MARPLOT search dialogue makes this easy. Pulldown menus in each category provide appropriate choices.

The simplest search is for all objects of a class. For the voluminous data available from LandView, this is not practical, but for the limited data in our example, it is ideal. The search is as follows:

Search for objects: "With Any Name", Layer(s) to Search: "All Layers", Map(s) to Search: "Selected Maps . . . " "Company Facilities"

The results are as shown below. Note that by judicious selection of object names and layer names specific objects are easily identified. An object can be selected by scrolling the list. Once selected, the **Show on Map & Zoom** button places the object in Select mode on the map display window.
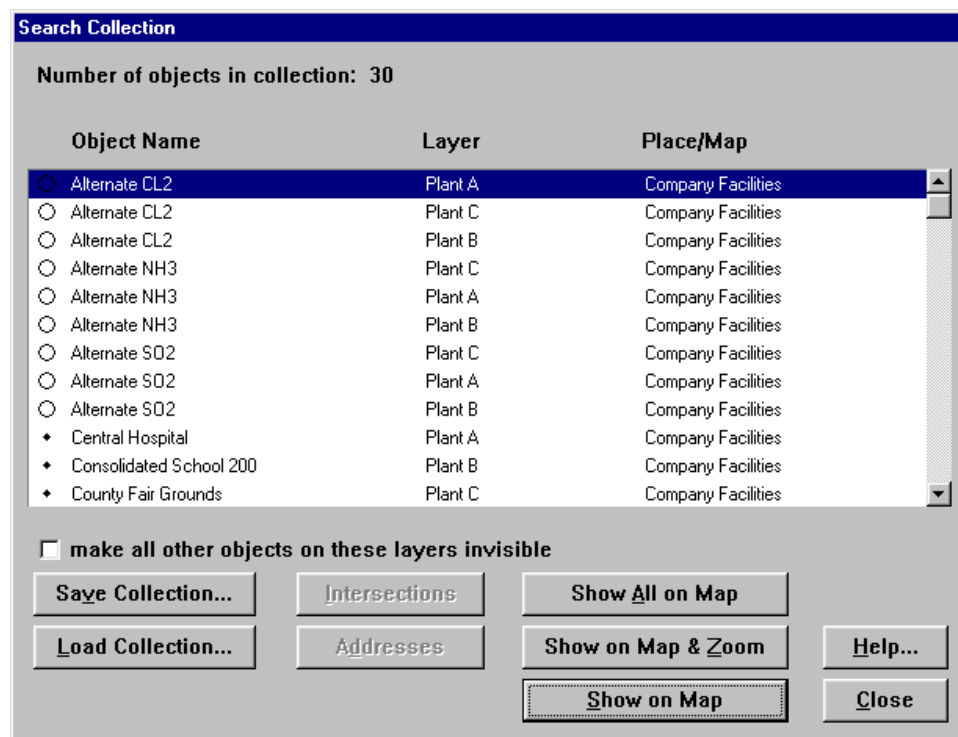

Perhaps we want to see all data related to Plant A. The search is as follows:

Search for objects: "With Any Name", Layer(s) to Search: "Individual Layer" "Plant A", Map(s) to Search: "Selected Maps . . . " "Company Facilities"

A more likely search might be to show the risk potential for a particular chemical at a particular plant. We want to know the risks associated with SO2 at Plant A. The search is as follows:

Search for objects: "With names that contain . . . " "SO2", Layer(s) to Search: "Individual Layer" "Plant A", Map(s) to Search: "Selected Maps . . . " "Company Facilities"
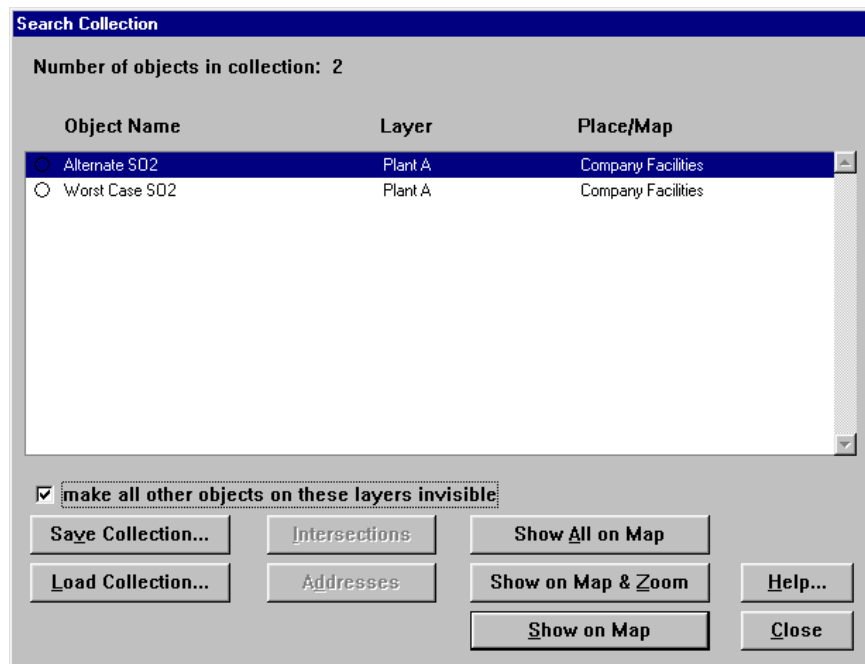
Using the **Show All on Map** button will place both the Alternate and Worst Case SO2 releases in Select mode. However, in this case, you will probably first want to 'check' the option to 'make all other objects on these layers invisible'. This will hide scenarios for CL2 and NH3. It will also hide the location of the facility. To show the facility location, it is necessary to use another built in bit of search functionality. It is necessary to institute a new search, as displayed in the following dialogue:
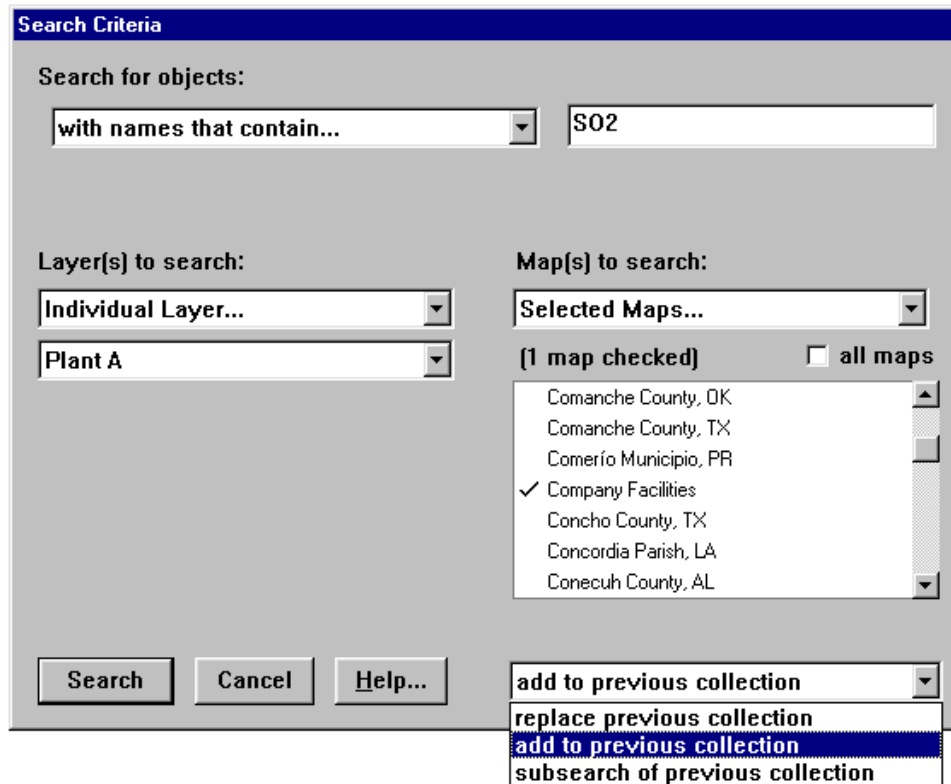
Note that choice of "add to previous collection" is the equivalent of the Boolean "or". A "subsearch of previous collection" is the Boolean equivalent of "and". Again, we will want to

hide unwanted objects on the layer. To provide additional context to the map display, in the following graphic, we have placed the Roads layers in display mode. Additionally, we have place the Census Demographic layer, Census Block Points, in display mode. This provides a visual display of census block points containing population or housing units.
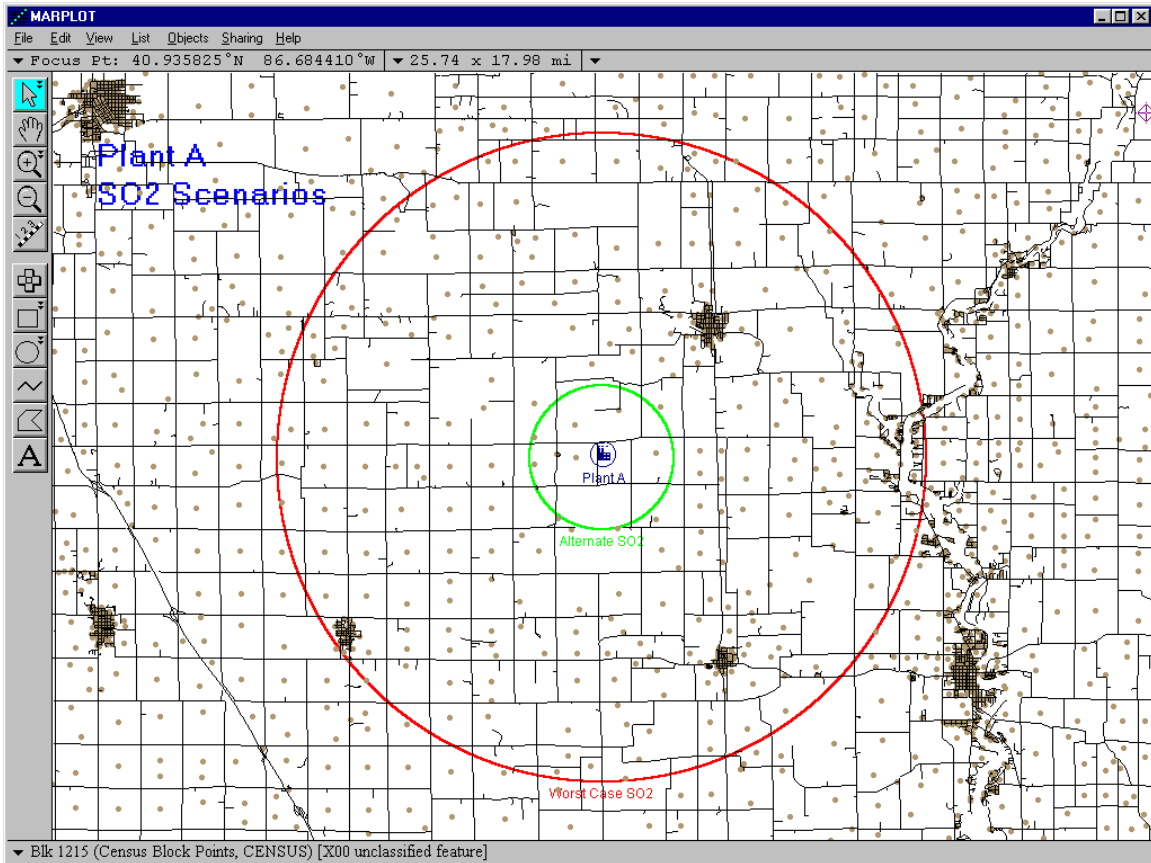
Note that, additionally, we have unlocked the **Temporary** layer (in the Group—**Other**) to add an identifying text to the printout. We have also placed the displayed objects on the 'Plant A' layer into **Display** mode which shows identifying labels.