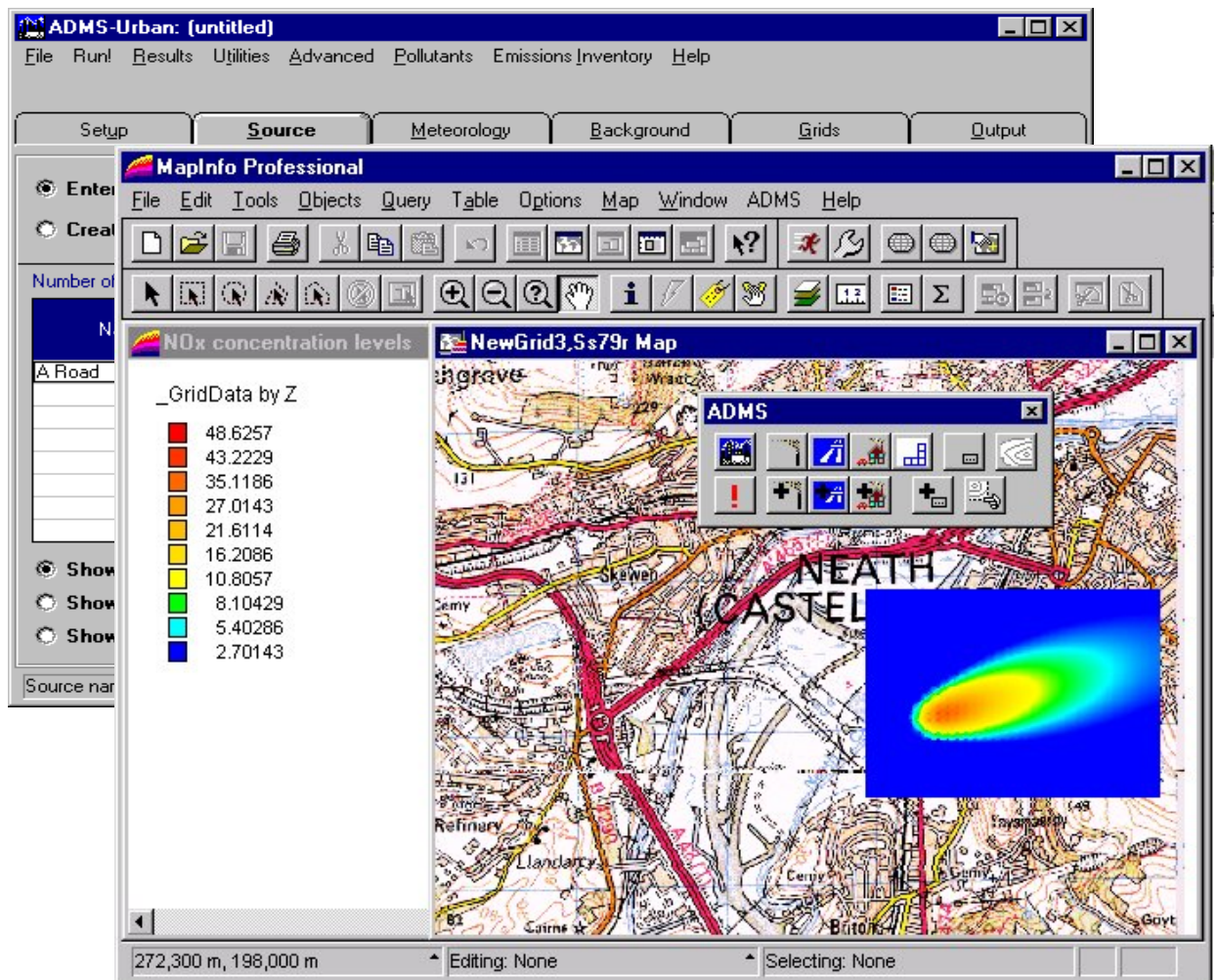# ADMS-Urban & ADMS-Roads
MapInfo Link

User Guide CERC

ADMS-Urban & ADMS-Roads MapInfo Link

User Guide

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CONTENTS

SECTION 1 Getting Started

In this document ADMS is used to refer to ADMS-Urban, ADMS-Roads and ADMS-Airport.

You will need the ADMS MapInfo Link, ADMS and MapInfo Professional[1]. If you have not already done so, you should install them following the instructions provided with each product.

To use the ADMS MapInfo link:

(a) Launch MapInfo Professional from the Start menu.

(b) From the MapInfo Tools menu choose Run MapBasic Program.

(c) The dialogue box shown below will appear. Browse for the ADMS MapInfo extension file ADMS_MI.MBX, which will have been created when you installed the link. By default it will be in the directory *<install_path>\Support\MapInfo*.
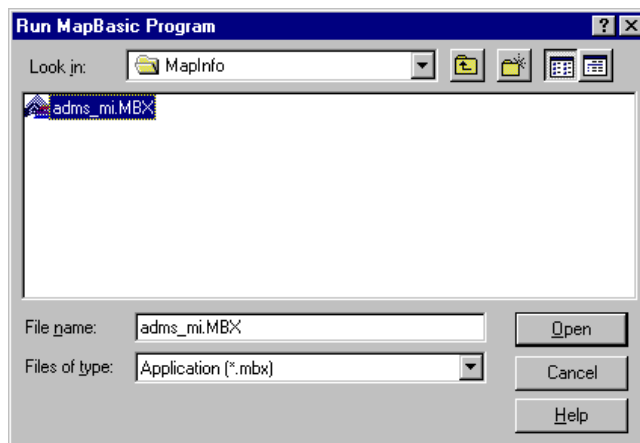
You are now ready to use ADMS with MapInfo.

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[1] Check cerc.co.uk for the full list of supported MapInfo Professional versions.

SECTION 2 An introduction to MapInfo

If you are new to MapInfo, we recommend that you complete the MapInfo tutorial and read the introductory chapters in the MapInfo manual. Some useful MapInfo concepts are summarised below to get you started.

2.1   MapInfo concepts

- All data in MapInfo, whether textual or graphic, is organized in **tables**. Each table is a collection of files that constitute either a map file or a database file.

- MapInfo presents table data on screen in three different formats

  ∗ **Map windows** present information arranged as maps, allowing you to visualize the geographic patterns of your data. Tables are viewed in individual **layers** in a Map window.

  ∗ **Browser windows** present information as tabular lists, just as conventional databases do.

  ∗ **Graph windows** present information arranged as graphs, allowing you to visualize and make comparisons of the purely numerical patterns.

2.2   Useful MapInfo controls

You may like to experiment with a few MapInfo controls.

- To zoom to a particular area of a map, click the Zoom In tool and either click on a particular point, or click and drag a rectangle.

- To return to see the whole map, select View Entire Layer from the Map menu, and then choose All Layers.

- To pan a Map window, click on the Grabber tool and then click and drag to show a different portion of the map.

- To zoom out, click on the Zoom Out button and click on the map.

2.3   Displaying a map image in MapInfo

It is often useful to check the positions of your ADMS sources against a map image, such as an Ordnance Survey map tile. Before you can do this, you must **register** the image so that it can be shown in a Map window. The advice below has been adapted from the MapInfo manual. Please refer to your MapInfo manual for more details.
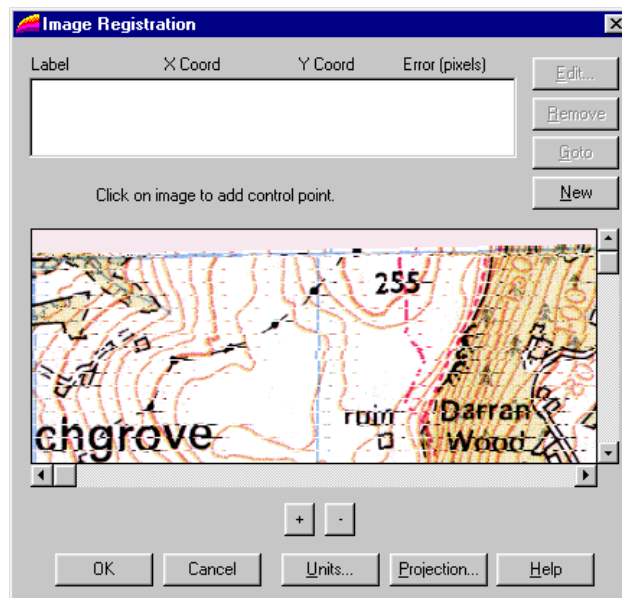
1.   Select Open... from the File menu.

2.   Change the file type to Raster Image. Select your map file and press Open.
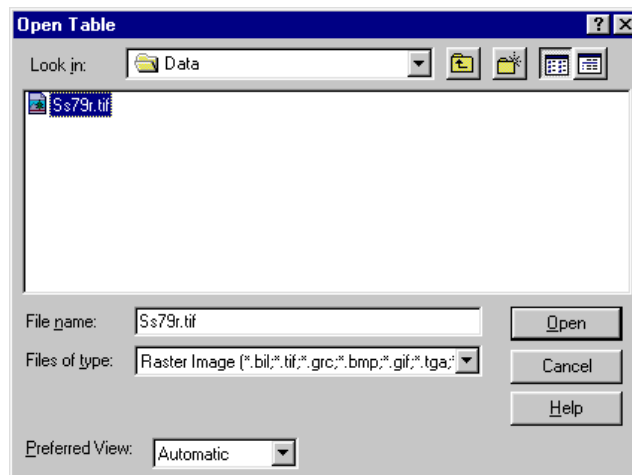
3.   Press the Register button in the resulting dialogue. The Image Registration screen will appear:

4.   Press the Projection... button, and choose an appropriate projection. For instance, in the UK you will probably select 'British National Grid' from the 'British Coordinate Systems' as shown below. Press OK when you have made a selection.
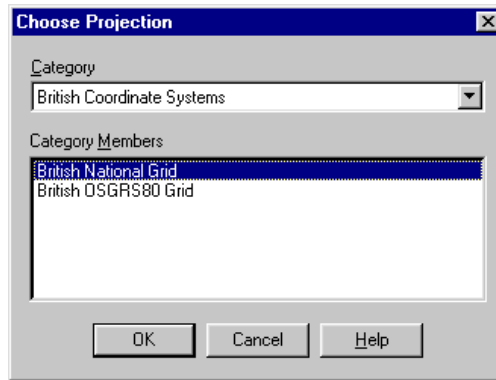
5. Now you must provide co-ordinates for at least four control points on the map so that MapInfo can determine the position, scale and rotation of the image. A control point is added as follows. Find a point on the image whos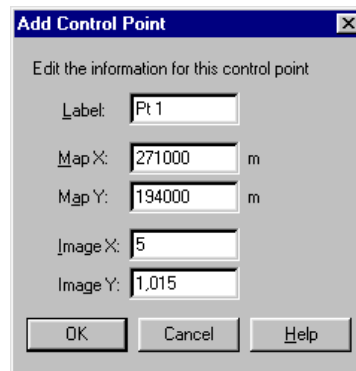e coordinates you know, such as a prominent landmark or perhaps a corner of the image. Click on the point and the dialogue box shown below will appear. Enter the co-ordinates of the point in the *Map X* and *Map Y* boxes then click OK.

The control point co-ordinates are listed in the Image Registration dialogue and can be edited if they are incorrect. Click OK when you have finished. The map is then displayed in a map window:
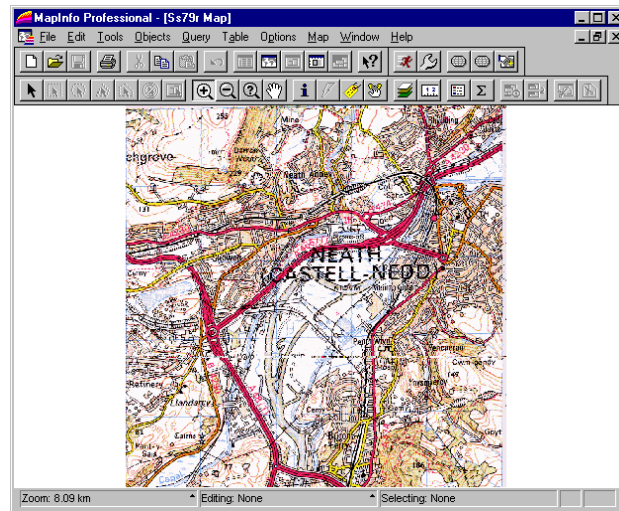
6. Save the registered map image by selecting Save Workspace… from the File menu, and selecting the map layer. This will save your map with the extension .*wor*.

You only have to register a raster image once. Each subsequent time you open the file, it can be opened like any other MapInfo workspace. Choose Open… from the File menu and select the .*wor* file created in step 6 above.

SECTION 3 Setting up an ADMS run using MapInfo

3.1   Overview

Once your map image is registered, you are ready to position sources on the map and set up an ADMS run.

You use the ADMS MapInfo extension by choosing options from the ADMS menu or by clicking buttons on the toolbar. The toolbar is shown in **Figure 3.1**, and the buttons are described in **Table 3.1**.

Figure 3.1 – The ADMS toolbar

Table 3.1 – Brief description of toolbar buttons in the MapInfo extension for ADMS.

Button	**Button Name**	**Action**
	Show ADMS	Makes the ADMS model interface active
	Show Aircraft Sources	Toggles the display of aircraft sources in the current ADMS *.upl* file in a Map window (only available with ADMS-Airport)
	Show Point Sources	Toggles the display of point sources in the current ADMS *.upl* file in a Map window
	Show Road Sources	Toggles the display of road sources in the current ADMS *.upl* file in a Map window
	Show Line Sources	Toggles the display of line sources in the current ADMS *.upl* file in a Map window
	Show Area Sources	Toggles the display of area sources in the current ADMS *.upl* file in a Map window
	Show Volume Sources	Toggles the display of volume sources in the current ADMS *.upl* file in a Map window
	Show Grid Sources	Displays the grid sources in the current ADMS *.upl* file in a Map window (not available with ADMS-Roads)

Butto n	Button Name	Action
	Show Receptor Points	Toggles the display of receptors in the current ADMS *.upl* file in a Map window
	Plot Pollution Contours	Creates a contour plot of concentrations based on ADMS output in the Map window
	Refresh	Updates the display
	Add Aircraft Source	Adds a new ADMS-Airport aircraft source where you click (only available with ADMS-Airport). Release the mouse button to end the aircraft source.
	Add Point Source	Adds a new ADMS point source where you click
	Add Road Source	Adds a new road source where you click (double-click to end the road source)
	Add Line Source	Adds a new line source where you click (double-click to end the line source)
	Add Area Source	Adds a new ADMS area source where you click (double-click to end the area source)
	Add Volume Source	Adds a new ADMS volume source where you click (double-click to end the volume source)
	Add Receptor Point	Locates a new receptor point for generating output concentrations
	Define Grid Area	Defines an output grid over the rectangle drawn
	Import ADMS File	Imports an ADMS output file into MapInfo
	Clip Points By Boundary	Clips a point layer according to the boundaries in a polygon layer
	Display Max Values	Displays the maximum concentration values in a layer

3.2 Creating point sources

Follow the steps below to create a point source from within MapInfo.

1. Click on the Show Point Sources button to display point sources, if you have not already done so.

2. Click the Add Point Source tool.

3. Click on the map window at the position you want to put your point source.

4. A new point source is created and displayed in the ADMS **Source** screen. The source co-ordinates will have been filled in automatically, but you will need to enter the other parameters for the source. To add another point source, return to MapInfo by clicking on the MapInfo window title bar, and click on a second position on the map.

5. To see the new point source in MapInfo, save the *.upl* file and then click on the Refresh button .

3.3 Creating road sources

Road sources can be created in a similar way to point sources.

1. Click on the Show Road Sources button to display road sources, if you have not already done so.

2. Click the Add Road Source tool.

3. Click on the map at the starting point of your road. Then, draw the road on the map, clicking once for each vertex. Double-click at the final vertex.

4. A new road source is created and displayed in the ADMS Source screen. The source co-ordinates will have been filled in automatically, but you will need to enter the other parameters for the source. For instance, refer to the ADMS manual for advice about road widths and canyon heights

5. To see the new source in MapInfo, save the *.upl* file and then click on the Refresh button .

3.4 Creating line sources

Line sources can be created in a very similar way to road sources.

1. Click on the Show Line Sources button to display line sources, if you have not already done so.

2. Click the Add Line Source tool.

3. Click on the map at the starting point of your line source. Then, draw the source on the map, clicking once for each vertex. Double-click at the final vertex.

4. A new line source is created and displayed in the ADMS Source screen. The source co-ordinates will have been filled in automatically, but you will need to enter the other parameters for the source.

5. To see the new source in MapInfo, save the *.upl* file and then click on the Refresh button

3.5　　Creating area sources

Area sources can also be created in a similar way to point sources.

1. Click on the Show Area Sources button to display area sources, if you have not already done so.

2. Click the Add Area Source tool .

3. An area source can have between three and fifty vertices. Click on the map at the position of one of the vertices. Then, moving around the source clockwise or anticlockwise, click at the position of the remaining vertices, double-clicking at the final vertex.

4. A new area source is created and displayed in the ADMS Source screen. The source co-ordinates will have been filled in automatically, but you will need to enter the other parameters for the source.

5. To see the new area source in MapInfo, save the *.upl* file and then click on the Refresh button .

3.6　　Creating volume sources

Volume sources can be created in a very similar way to area sources.

1. Click on the Show Volume Sources button to display volume sources, if you have not already done so.

2. Click the Add Volume Source tool .

3. A volume source can have between three and fifty vertices. Click on the map at the position of one of the vertices. Then, moving around the source clockwise or anticlockwise, click at the position of the remaining vertices, double-clicking at the final vertex.

4. A new volume source is created and displayed in the ADMS Source screen. The source co-ordinates will have been filled in automatically, but you will need to enter the other parameters for the source.

5. To see the new volume source in MapInfo, save the *.upl* file and then click on the Refresh button .

3.7　　Creating aircraft sources (ADMS-Airport only)

Aircraft sources can also be created in a similar way to point sources.

1. Click on the Show Aircraft Sources button to display aircraft sources, if you have not already done so.

2. Click the Add Aircraft Source tool .

3. An aircraft source must be a simple line with only two vertices. Click on the map at the position for one end of the source. Then, hold down the mouse button and drag to the position of the other end. Release the mouse button to complete the source.

4. You will be prompted for the name of the new aircraft source (see below).

5. A new line will automatically be written to the end of the *.air* file. The Src_Name, X0, Y0, X1, and Y1 columns will be filled in. The other columns are set to default values (-999). You must edit the *.air* file manually and fill in these columns with valid entries. Refer to the ADMS-Airport User Guide for further details. You can open the *.air* file for editing by clicking the **Edit** button in the ADMS-Airport interface.

6. To add another aircraft source, return to MapInfo by clicking on the MapInfo window title bar, and repeat the steps.

7. Click the refresh button to show the location of the new aircraft source(s) in MapInfo.

3.8 Defining an output grid

You can use MapInfo to help you define an output grid.

1. Click on the Define Grid Area button .

2. Click on the map at one of the corner of the output grid area and hold down the mouse button. Now drag the mouse to the opposite corner of the area. A rectangle will appear on the map while you drag the mouse. When the rectangle reaches the size you require release the mouse button.

3. The ADMS Grids screen will appear with the new output grid co-ordinates. You may correct them by hand if you wish.

3.9   Adding specified points

Follow the steps below to define receptors (also known as "specified points") using MapInfo.

1. Click the Show Receptor Points button ▭ to view the location of existing receptors, if you have not already done so.

2. Click the Add Receptor Point button ▭

3. Click on the map at the position for the new receptor point.

4. The ADMS Grids screen appears, showing your new specified point with the coordinates of the point at which you clicked. You should provide a name for the point.

5. Save the *.upl* file and then click on the Refresh button ▭ to view the new receptor in MapInfo.
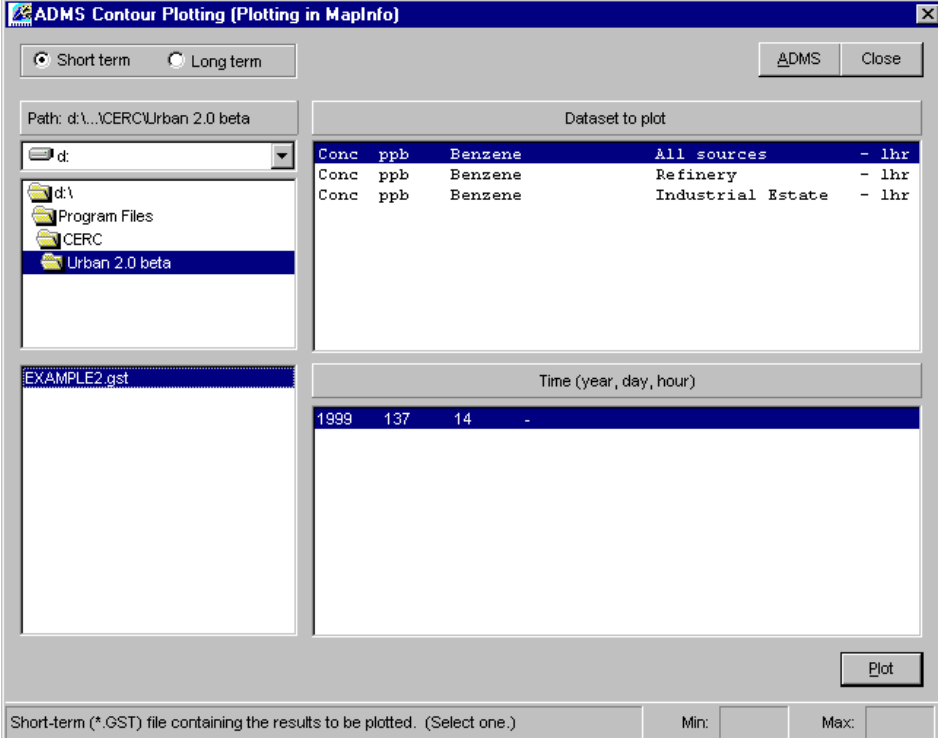
SECTION 4 Displaying ADMS results in MapInfo

4.1   Producing contour plots from ADMS results

Once you have completed the definition of a problem in an *.upl* file and run the model, you can create contour plots. Please note that you must have used gridded output to create a contour plot. On the Grids screen the Select output option must be either Gridded or Both.

Follow the steps below to produce a contour plot.

1.   Press the Plot Pollution Contours button ⬢.

2.   The ADMS Contour Plotter screen will appear. Select the data file and dataset you wish to plot, and press Plot.

3. The screen below will appear, allowing you to specify a file name and the cell size for the calculation. Click OK when you have done this.
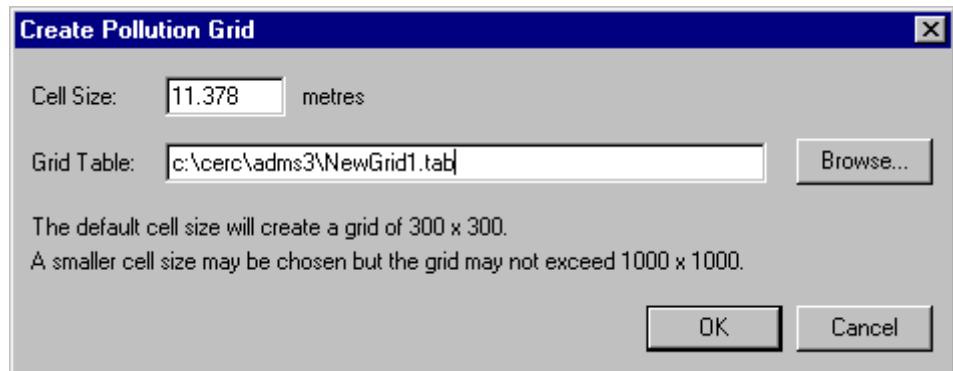
- MapInfo stores contour plots in *.tab* files, like all tables. It is good practice to store your *.tab* files in a directory with your input files and other data. Click Browse**...** and choose a suitable location.

- You can use the cell size to control how much detail is shown in your contour plot. MapInfo calculates a value for each cell in the grid and plots the contours accordingly.

4. After spending a few moments interpolating the data, MapInfo will display a contour plot of your results. An example contour plot is shown below.
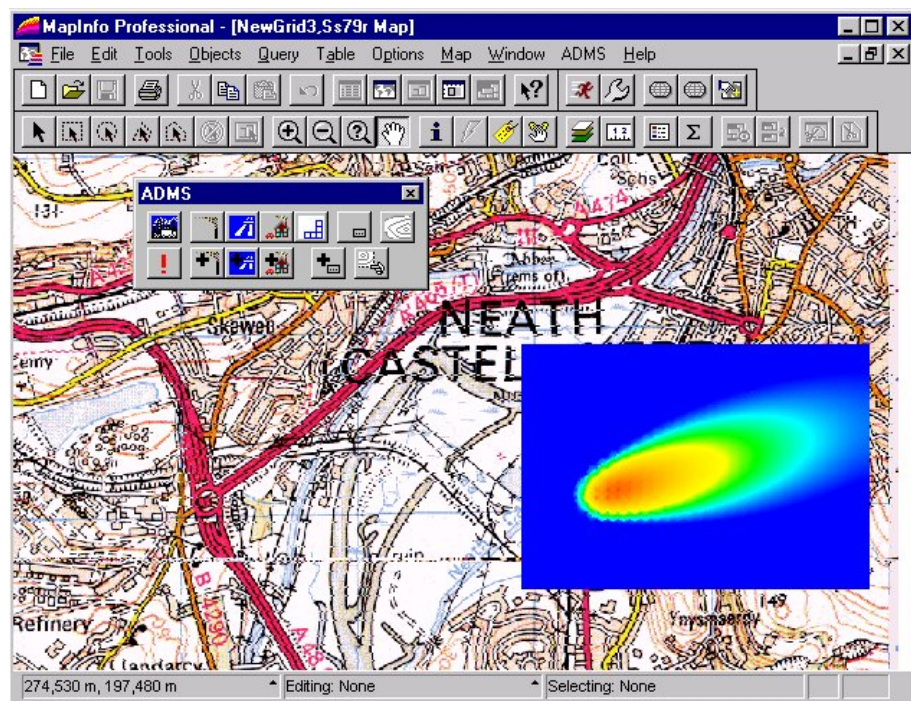
4.2 Creating a legend for your contour plot

You may want to create legends for your contour plots. The advice below has been adapted from the MapInfo manual. Please consult the online help or your MapInfo manual for further details.

1. Select Create Legend from the MapInfo Map menu. The Create Legend wizard will appear as shown below.
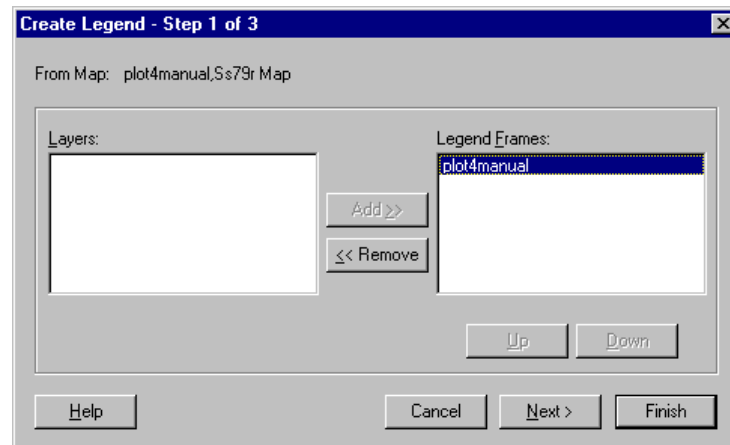
2. If necessary, use the *Add* and *Remove* buttons to make sure that the Legend Frames group contains only the layers for which you want to create a legend.

3. Click Next. Step 2 of the wizard appears as shown below.
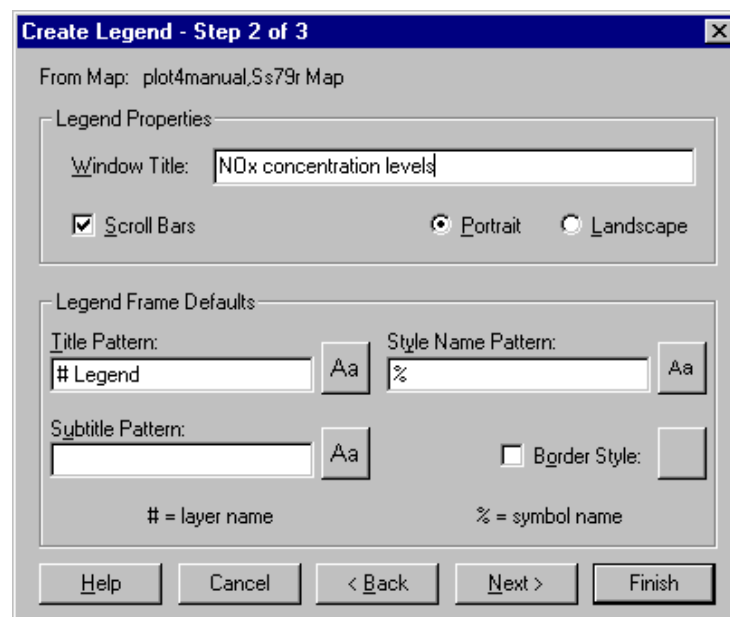
4. Provide a title for the legend and click Next. Step 3 of the wizard appears as shown below.
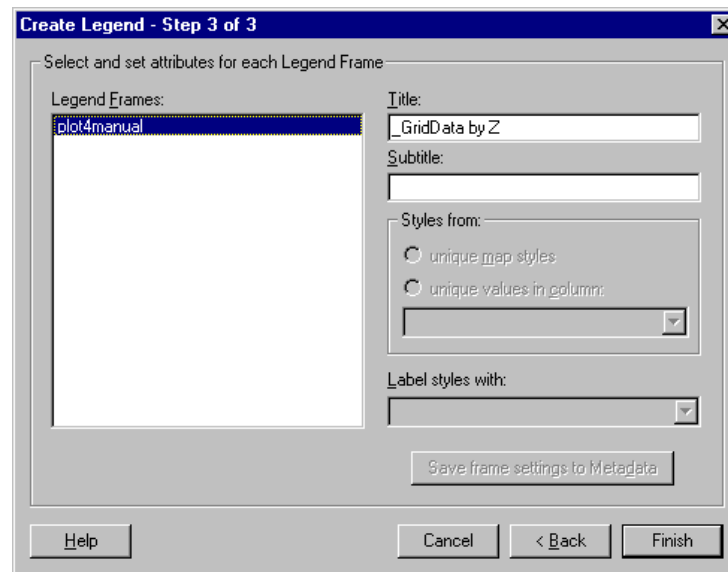
5. Click Finish. The legend will be displayed in MapInfo. You may wish to choose Tile Windows from the Window menu to view the legend and the contour plot together, as shown below
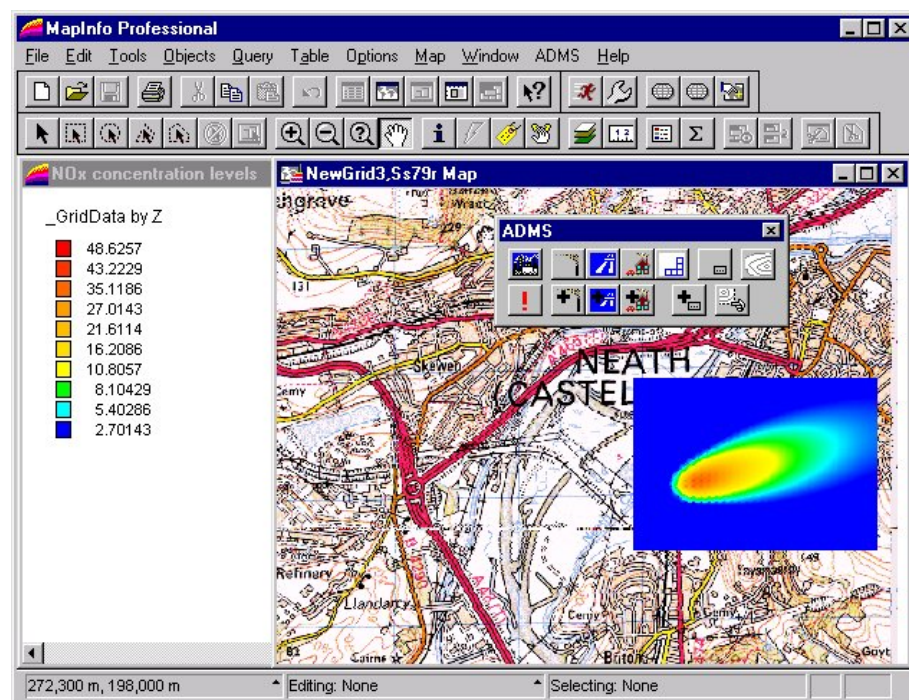
4.3 Further hints on contour plots

As you become more experienced with MapInfo contour plots you may find the following hints useful. You may also like to consult the MapInfo user manuals and online documentation for more information on the commands involved.

- To temporarily hide a contour plot layer

    1. Click on the MapInfo Layer Control button

    2. Find the layer you wish to hide in the resulting dialogue. Click the mouse under the Visible column 👁 to remove the tick for that layer.

- To remove a contour plot from a map window

    1. Click on the MapInfo Layer Control button

    2. Find the layer you wish to hide in the resulting dialogue. Click Remove at the bottom of the dialogue box.

- To generate a translucent plot or change the colours used

    MapInfo gives you great control over the display of your contour plots. The steps below are provided simply as an example. Consult the MapInfo documentation for more ideas about the display of your plots.

    1. Select Modify Thematic Map from the Map menu. The Modify Thematic Map dialogue will appear.
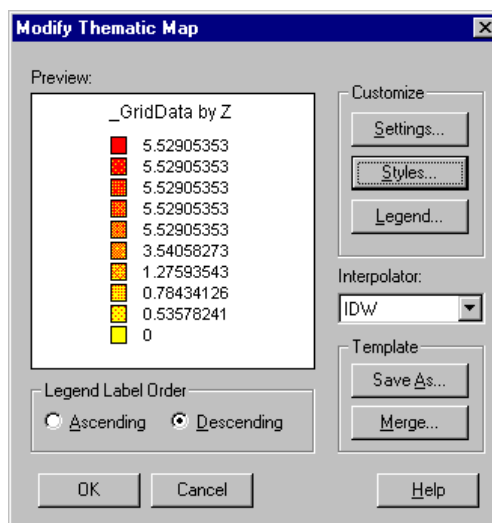
2. Click the **Styles** button. The screen shown below will appear.
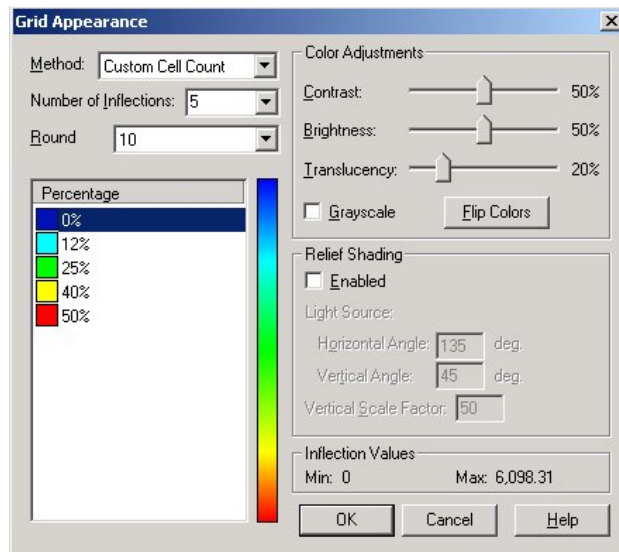
- You may like to use the Translucency slider so that your background map shows through the contours.

- The colours used in the plot are controlled by the inflection method and the number of inflection points. You can change the number of colours by changing the Number of inflections in the dialogue. You can change the colour for a particular value by double-clicking the colour sample in the list under the Percentage caption, and selecting a new colour in the resulting dialogue. The example below uses translucency and custom colours.
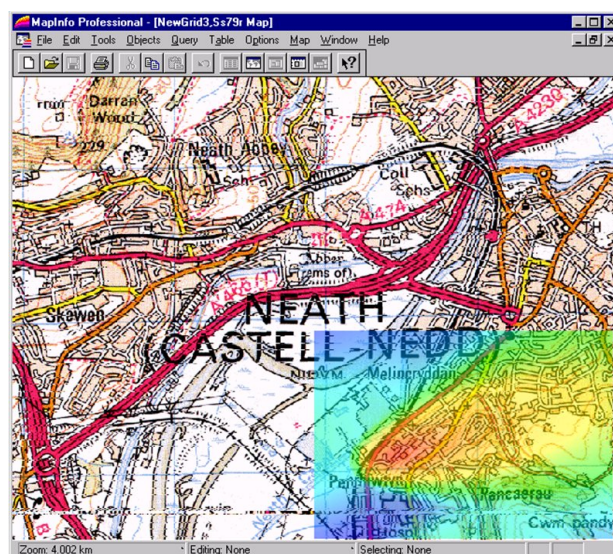
SECTION 5 Displaying Maximum Concentration Values

The ADMS Link provides the facility to calculate the maximum concentration values in an ADMS output file outside, or inside, a site boundary. Typically you would run the following three options in order: import an ADMS output file, following the instructions in Section 5.1; delete unwanted points by following the instructions in Section 5.2; and finally display the maximum concentration values of the remaining points, following the instructions in Section 5.3.

5.1   Importing ADMS Output Files

Converts an ADMS output file (*.glt, .gst, .plt, .pst*) into a point table, which can be viewed in MapInfo. The field values of the points provide the ADMS output values and coordinates for that point.

1. Click on the Import ADMS Output button and locate the file to import from the Select the ADMS output file to import dialogue.
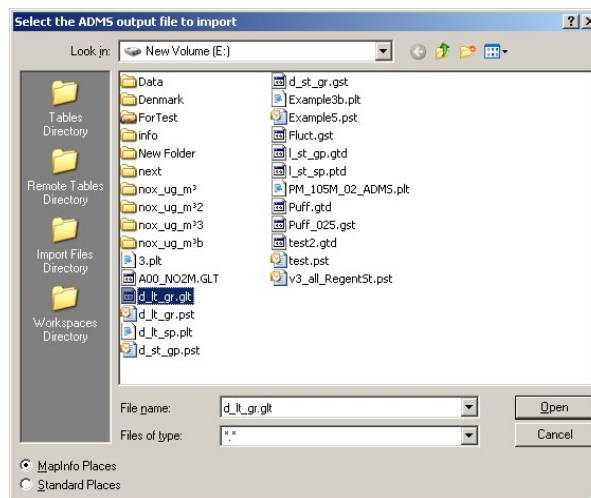
2. Select the name and location of the resulting *.tab* file in the Choose a TAB output file dialogue.
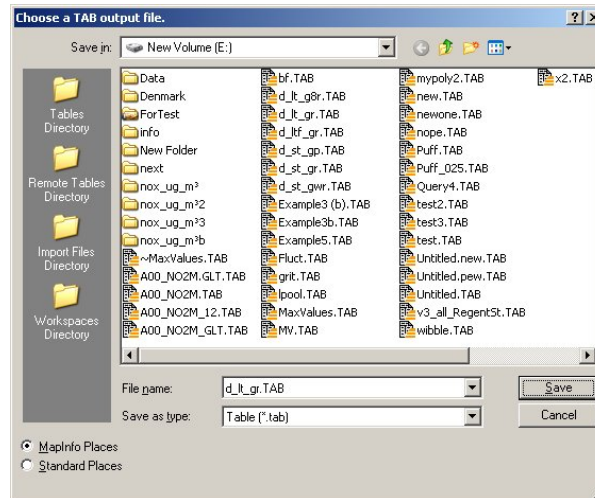
3. Click Save.

5.2   Clip Points by Boundary

This step deletes points from a point table, by comparing against a set of polygons in a boundary table, e.g. deleting the points outside a site boundary.

1. Ensure the point and boundary tables are open in MapInfo.

2. Click on the Clip Point by Boundary button [image] to display the Clip Points by Boundary dialogue.
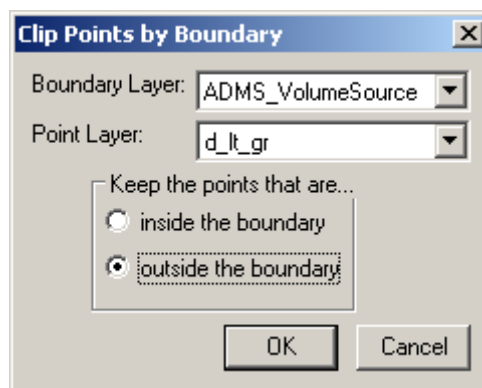
3. Select the layer containing the constraining polygons from the Boundary Layer drop-down.

4. Select the layer containing the ADMS point data from the Point Layer drop-down.

5. Choose whether to keep only the points within the boundaries, or only the points outside the boundaries.

4. Click OK

5.3   Display Maximum Concentration Values
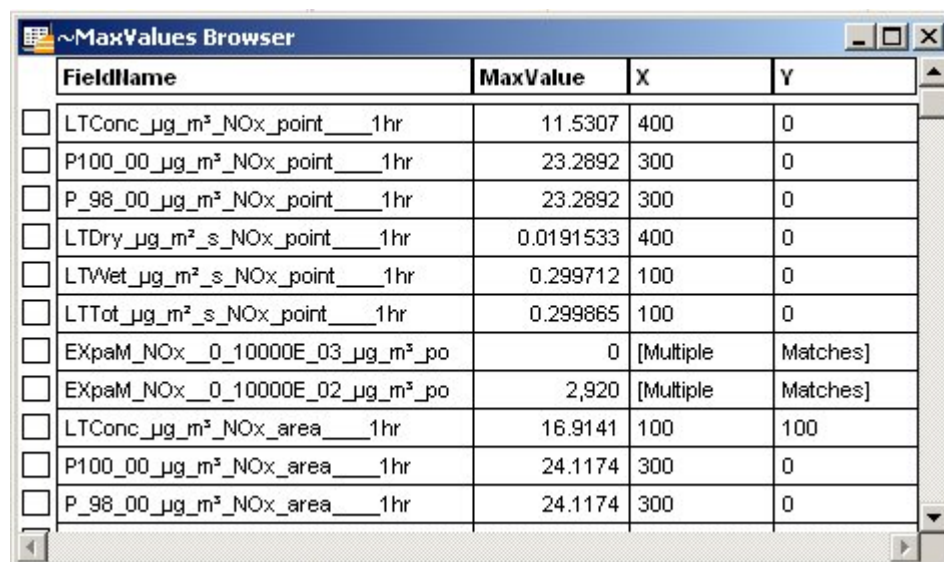
This step reports on the maximum value for each field in a point table.

1. Click on the Display Max Values button **Max** to display the Display Max Values dialogue.
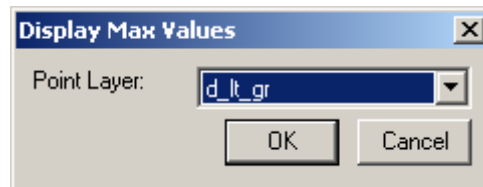
2. Select the point layer in the drop-down and click OK to open a new browser window containing the maximum values for each concentration recorded in the file.
    The information in the browser is also automatically copied, ready to paste into another program, e.g. Microsoft Word.

	FieldName	MaxValue	X	Y
☐	LTConc_µg_m³_NOx_point_____1hr	11.5307	400	0
☐	P100_00_µg_m³_NOx_point_____1hr	23.2892	300	0
☐	P_98_00_µg_m³_NOx_point_____1hr	23.2892	300	0
☐	LTDry_µg_m²_s_NOx_point_____1hr	0.0191533	400	0
☐	LTWet_µg_m²_s_NOx_point_____1hr	0.299712	100	0
☐	LTTot_µg_m²_s_NOx_point_____1hr	0.299865	100	0
☐	EXpaM_NOx__0_10000E_03_µg_m³_po	0	[Multiple	Matches]
☐	EXpaM_NOx__0_10000E_02_µg_m³_po	2,920	[Multiple	Matches]
☐	LTConc_µg_m³_NOx_area_____1hr	16.9141	100	100
☐	P100_00_µg_m³_NOx_area_____1hr	24.1174	300	0
☐	P_98_00_µg_m³_NOx_area_____1hr	24.1174	300	0

3. Click a row's selection checkbox to highlight that row's maximum value point on the map.

SECTION 6 Emissions Inventory

Sections 3 and 4 of the ADMS User Guide describe how to set up ADMS model runs when there is a small amount of source data involved by typing the data into boxes in the interface. However, ADMS users will typically have a large volume of data, for instance, if they have compiled their own emissions inventory. In that case, rather than typing data into the interface, the tools described in this section can be used to set up model runs and manipulate the data. These tools use the *ADMS Emissions Inventory*, which is a Microsoft Access database with a format such that the data can be directly imported into ADMS.

The available routes for getting from the raw emissions data to an ADMS *.upl* file are illustrated in **Figure 6.2**. The route from raw data to a *.upl* file followed by most users is via Steps A, B, C and E. The route shown by Step I is for grid (aggregated) sources only, although in Step G point, road or grid sources may be imported and then aggregated. These steps are described in the sections below. The route shown by step J makes use of the Extract Sources From CSV File... utility which provides an alternative method for importing sources, this is described in Section 6.6 of the ADMS User Guide.

Another piece of CERC software, EMIT, an **EM**issions **I**nventory **T**oolkit, is a convenient, alternative way to prepare data corresponding to Steps A to B. Further information about EMIT can be found at www.cerc.co.uk/environmental-software/EMIT-tool.html.

Selecting an ADMS Emissions Inventory file

When ADMS is installed on your PC, the default ADMS Emissions Inventory file is the file *inventry.mdb* located in the ADMS installation directory, for example, *C:\CERC\ADMS-Urb*.

You will probably want to work with several different inventories (i.e. several different *.mdb* files), for instance, because each inventory contains a different year's data or a different management scenario. You can create new inventory files, and change from one to another, via the ADMS interface. In ADMS, select the File, Preferences, Inventory Database... menu. This will open the screen shown in **Figure 6.1**.
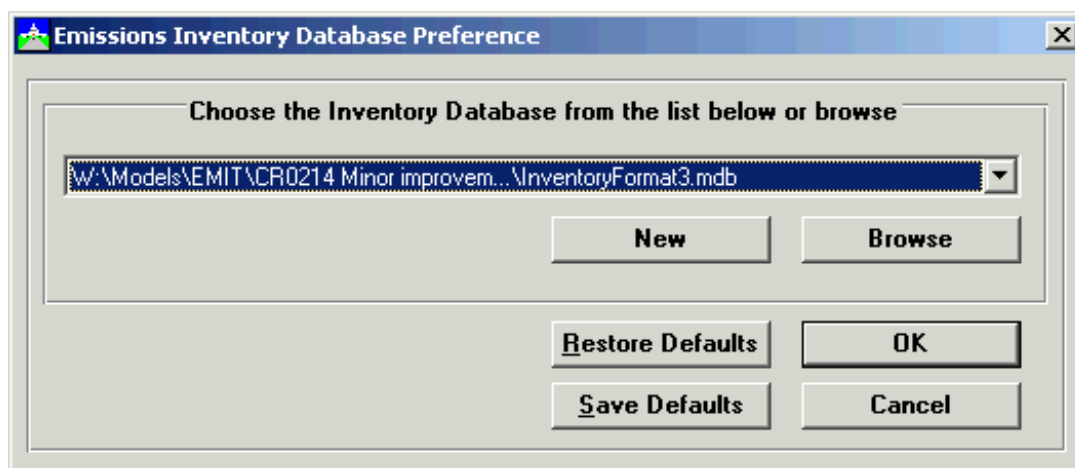
Figure 6.1 – The Emissions Inventory Database Preference screen.
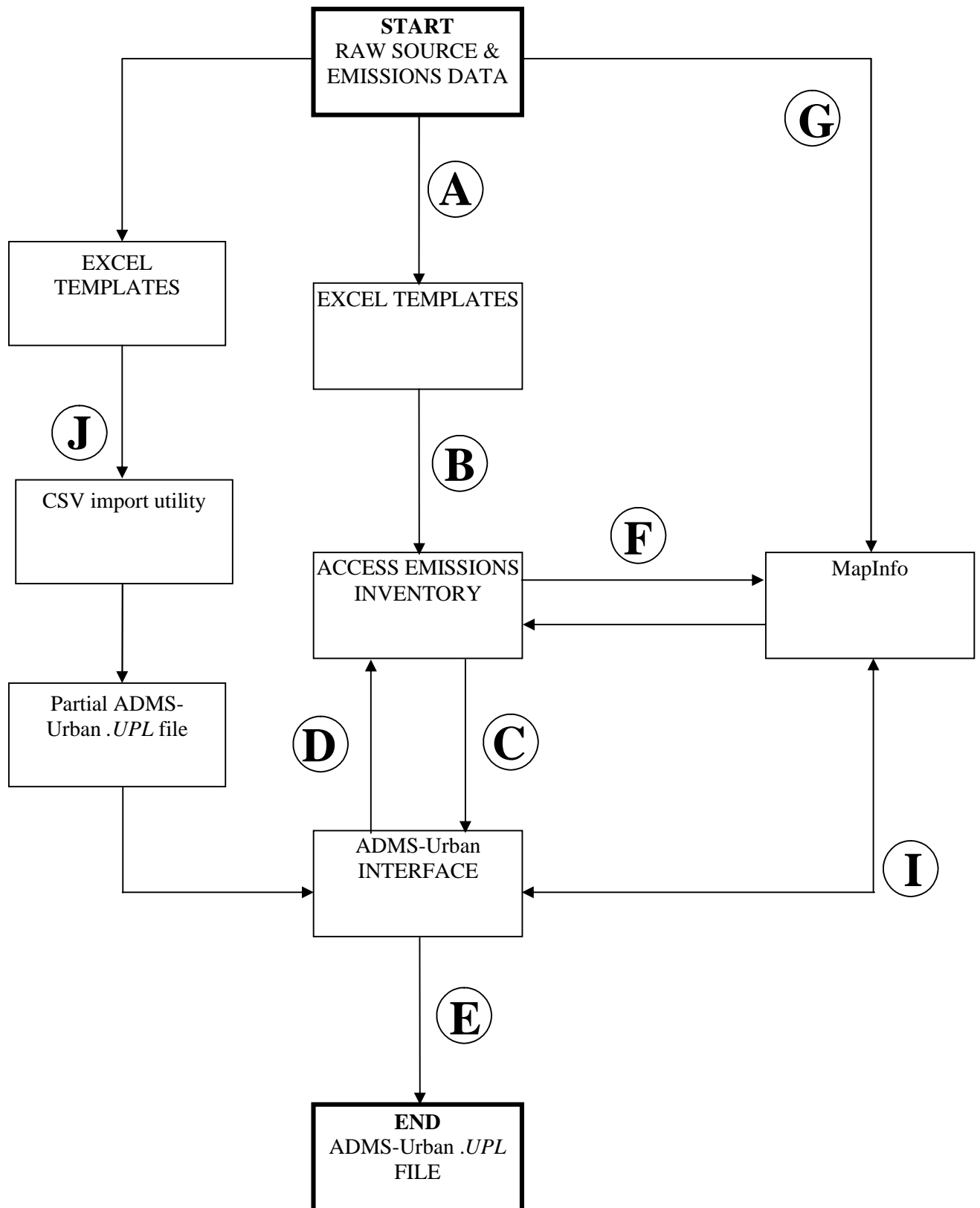
Figure 6.2 – The steps involved in manipulating raw source and emissions data into
an ADMS .upl file. Note that Step H applies to grid sources only. (Grid sources are
not available with ADMS-Roads.)

In the remainder of this section, details of steps F, G, H and I for manipulating source and emissions data depicted in **Figure 6.2** are given.

6.1 Step F – Transferring data from the ADMS Emissions Inventory to MapInfo

Once you have loaded your data into the Access Emissions Inventory, it can be transferred into MapInfo. This can be useful, for example, to check whether sources have been correctly located.

To use MapInfo and ADMS in conjunction with the Inventory, start up MapInfo. Select Run MapBasic Program… from the Tools menu of MapInfo and load both the ADMS Urban and Roads extension (*adms_mi.mbx*) and the ADMS Emissions Inventory extension (*ei_mi.mbx*) (see **Figure 6.3**).
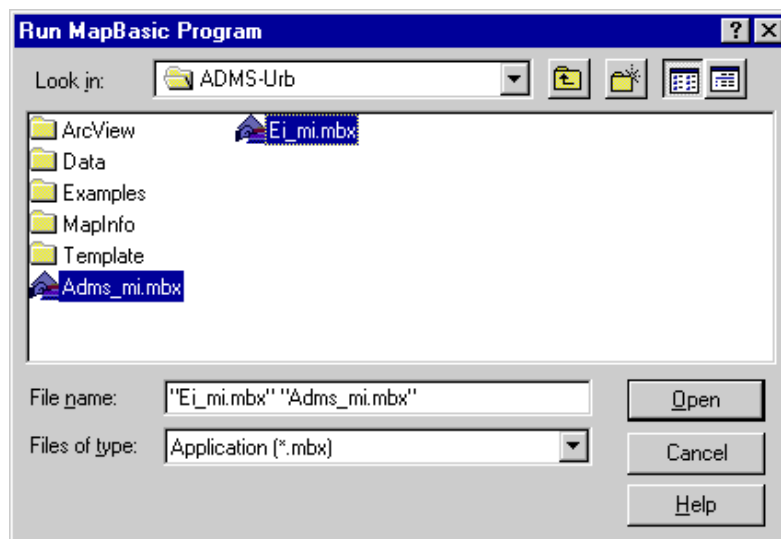
Figure 6.3 – The Run MapBasic Program dialogue box.

MapInfo will then ask you to select an emissions inventory database, as shown in **Figure 6.4**.

Figure 6.4 – The Select emissions inventory database screen.

Use the Browse… button to choose a database and click OK.

To display the emissions inventory sources in MapInfo, first ensure there is a Map window already open and active (see the earlier sections for information on how to do this), then select the appropriate option for the source type you

wish to display from the Emissions menu. For example, to display the road source data, select Add Emissions Inventory Road Source Layer from the Emissions menu and after a few seconds the data will be added to the Map Window.

The title bar of the Map window lists the layers that are displayed in the Map window.

If the Map window then appears blank, but the name of a layer is written in the title bar of the Map window, select View Entire Layer... from the Map menu, then select the layer shown in the map window title bar from the drop down menu in the resulting dialogue box, and click on OK. To remove a map layer from the Map window, press the Layer Control button , select the layer to be removed, and then click on OK. An example of a displayed emissions inventory road source layer is shown in **Figure 6.5**.
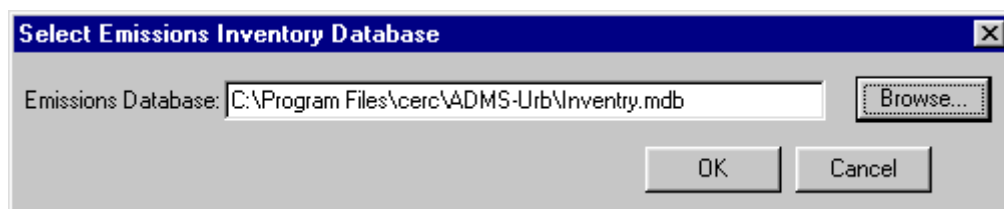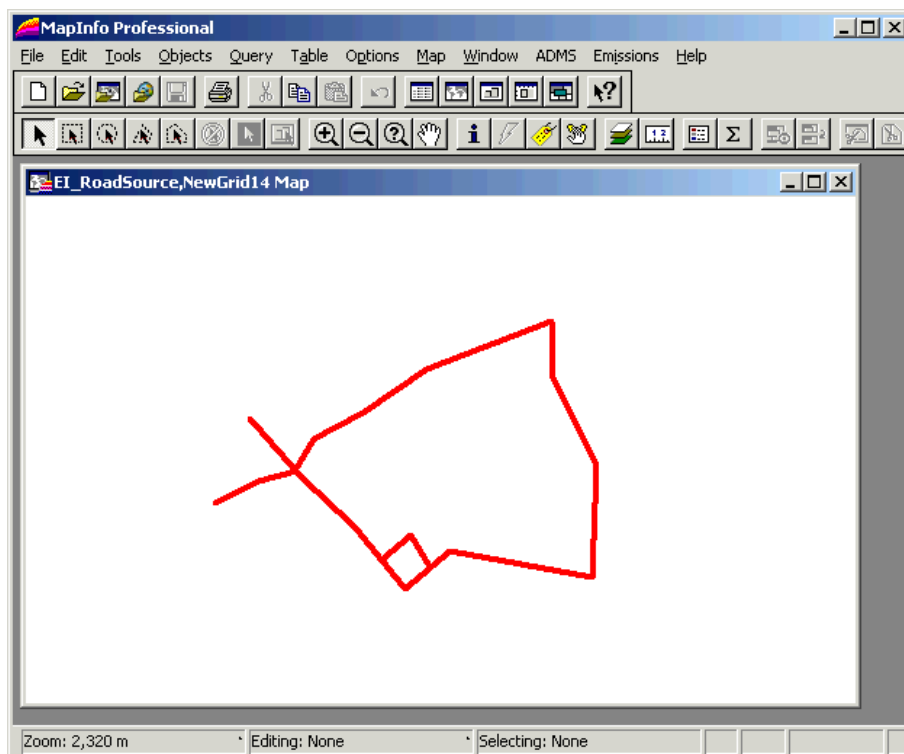

Figure 6.5 – Emissions inventory road source displayed in a Map Window.

To view the data in the emissions inventory in the form of a table, select New Browser Window from the Window menu, or press the New Browser button , then choose the layer you want to be displayed as a table in the browser window. If there is only one layer displayed in the map window, then the table for this layer is automatically displayed in the browser window when the above steps are followed.

To change to a different emissions inventory database, choose Change Database from the Emissions menu. You will be notified that MapInfo will automatically refresh the data from a database selected by this method (see **Figure 6.6**), and you are given the option to Proceed or Cancel.

Figure 6.6 – Query box shown when changing Emissions database.

As well as displaying the data from the emissions inventory the MapInfo Emissions Inventory link can be used to create a grid source by aggregating other sources, and then to export the grid source to the ADMS interface for modelling. These options are described in Sections 6.3 and 6.4.

The ADMS MapInfo Emissions Inventory link can also be used to select sources, for instance those emitting above a certain threshold or those belonging to a certain plant operator, and export the sources to ADMS. This is described in Section 6.4.
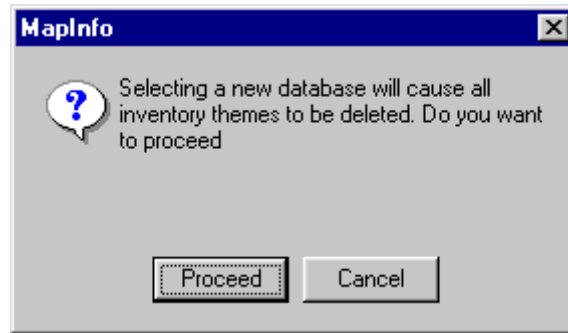
6.2   Step G – Importing Raw Source and Emissions Data into MapInfo

It is possible to transfer raw source and emissions data for industrial sources directly into MapInfo (Step G). These data cannot be exported as individual sources to the ADMS Emissions Inventory or the ADMS interface. However, the sources can be aggregated into a grid source in MapInfo, as described in Section 6.3. This grid source can then be exported to the emissions inventory and hence to the ADMS interface. This example shows how data for four industrial stacks can be imported to MapInfo.

If the point source data are held in an Excel file, you should save these data as a *.txt*, *.xls* or *.xlsx* file in order to import it into MapInfo. To save the data as an *.xlsx* file, select all cells containing data as shown in **Figure 6.7**. In Excel select File, Save As and save the data as an Excel workbook. This *.xls or .xlsx* file can now be read into MapInfo as a table. Road or grid source data are likely to be available as an ArcView *.shp* or MapInfo *.mif* file in which case the data can be loaded directly into MapInfo.
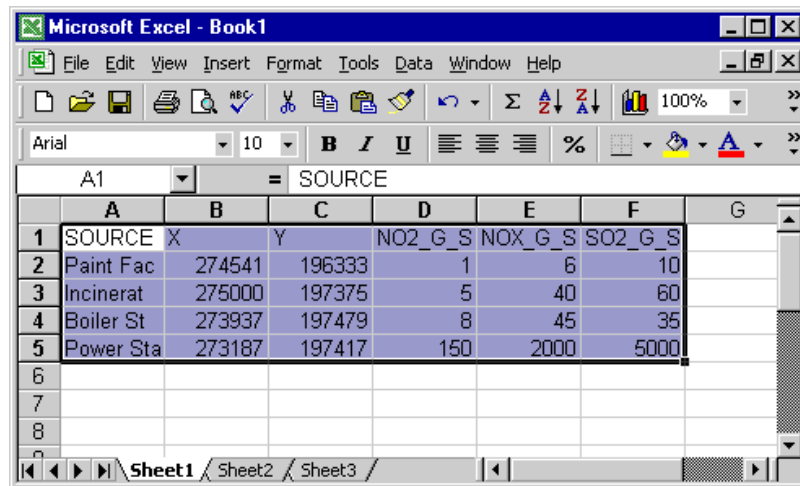
Figure 6.7 – Selecting data in Excel for exporting as an *.xls* or *.xlsx* file.

Launch MapInfo. Open an existing workspace, for example, one containing a map tile on which to plot the source locations.

Select Open… from the File menu of MapInfo, and in the resulting dialogue box change the file type to *.xls* or *.xlsx*. Browse to select the file that you wish to add. Leave the preferred view on the default option of Automatic. Click on OK.

In the following screen, shown in **Figure 6.8**, check Use Row Above Selected Range for Column Titles and ensure that the required worksheet name is displayed. Click on OK.
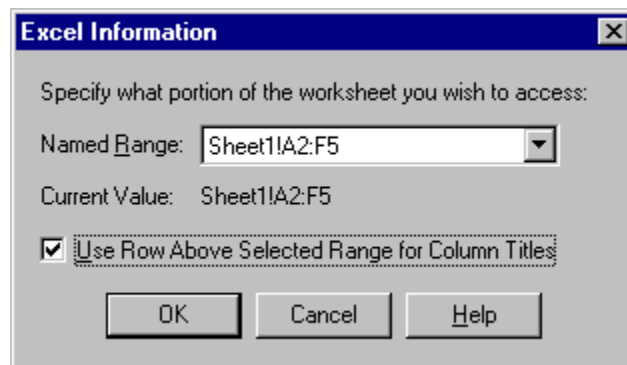

Figure 6.8 – MapInfo Excel Information screen

In the following screen, shown in **Figure 6.9**, leave the Field Properties on the default setting. Click on OK.
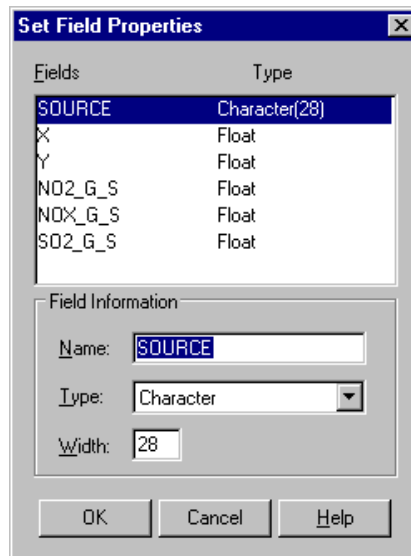
Figure 6.9 – Selecting data in Excel for exporting as an *.xls* or *.xlsx* file.

The data have now been added to MapInfo as a Table in a Browser Window. If you resize the map window then the table and grid tile are shown as in **Figure 6.10**.

Figure 6.10 – An imported *.xls* or *.xlsx* file in MapInfo.

To plot these data on the map tile, select Create Points... from the Table menu. In the dialogue box, as shown in **Figure 6.11**, select the table you want to create points for (Locations in this example), specify which column contains the X and Y co-ordinates and ensure that the co-ordinates are only multiplied by 1.
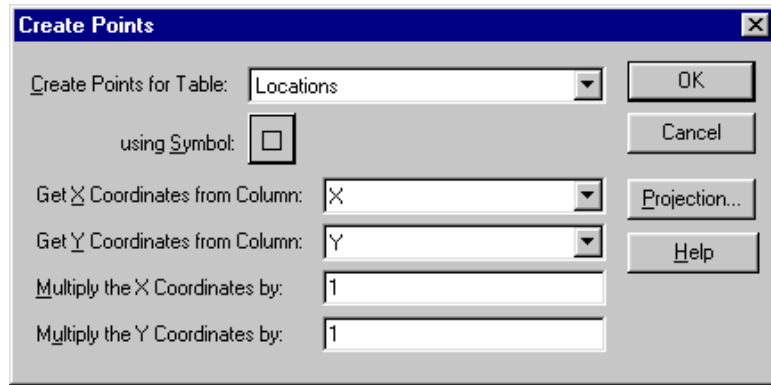
Figure 6.11 – Creating points from a table in MapInfo.

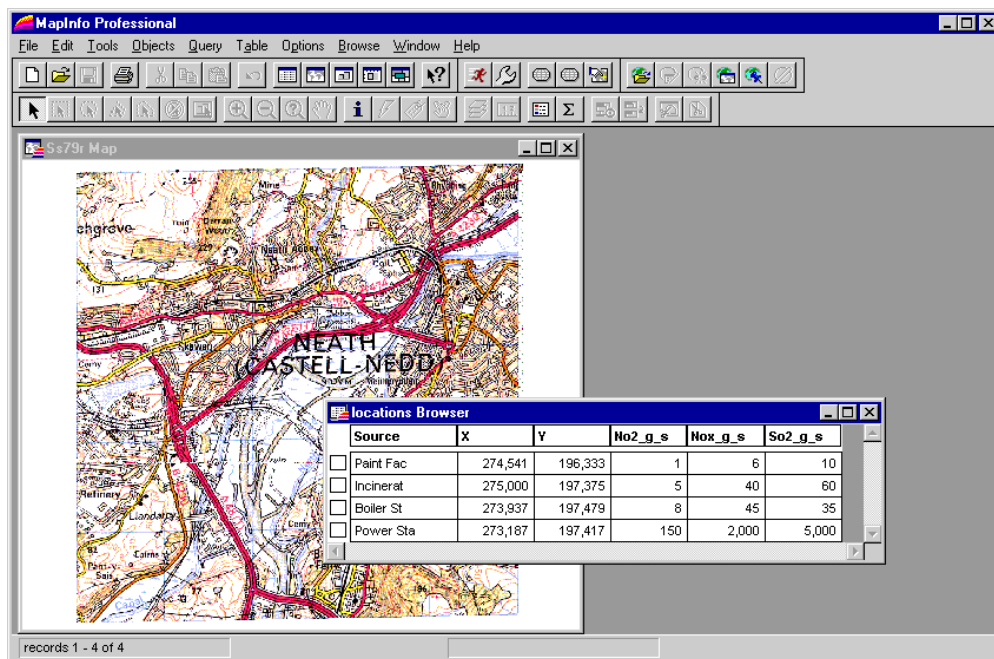To change the symbol used to illustrate these points on the map tile, click on the symbol button and edit the symbol design, as shown in **Figure 6.12**. Click on OK.
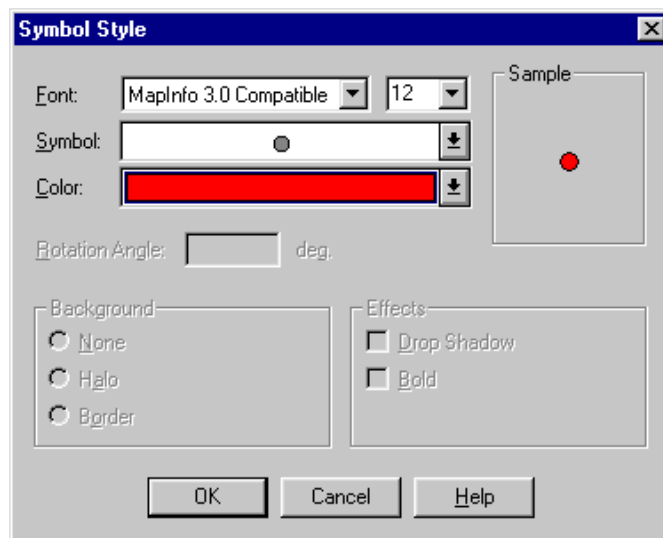
Figure 6.12 – Changing the symbol style.

The projection of the data in this table also needs to be defined so that it is the same as that used in the map tile. For instance, in the UK you will probably be using the National Grid, so click the Projection... button, change the category to British Coordinate Systems, and the category member to British National Grid, as shown in **Figure 6.13**. Click OK, then OK again in the Create Points dialogue box.
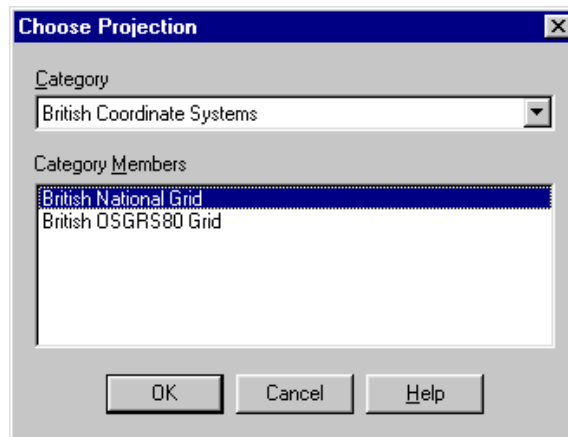
Figure 6.13 – Projection selection in MapInfo.

Make the Map Window active by clicking on the title bar of the map window (the title bar should now show blue rather than grey). Bring up the Layer Control dialogue box as shown in **Figure 6.14** either by using the button on the toolbar , or from the Map menu, and click Add.

Figure 6.14 – Layer Control dialogue box.

In the resulting dialogue box shown in **Figure 6.15** select the layer to be added (Locations in this example), then click Add, then OK.

Figure 6.15 – Adding a layer in MapInfo.

The data are now added to the chosen view as a layer as in **Figure 6.16**.

Figure 6.16 – An imported *.xls* or *.xlsx* file added to a Map window as a Layer.

6.3 Step H – Creating a grid source in MapInfo and exporting it to an ADMS Emissions Inventory

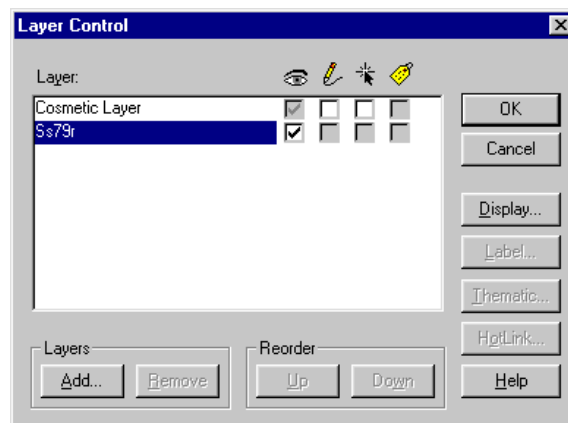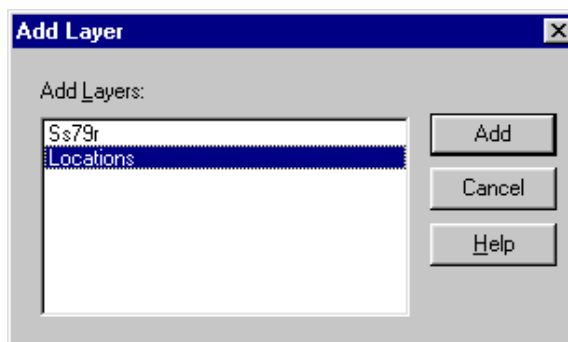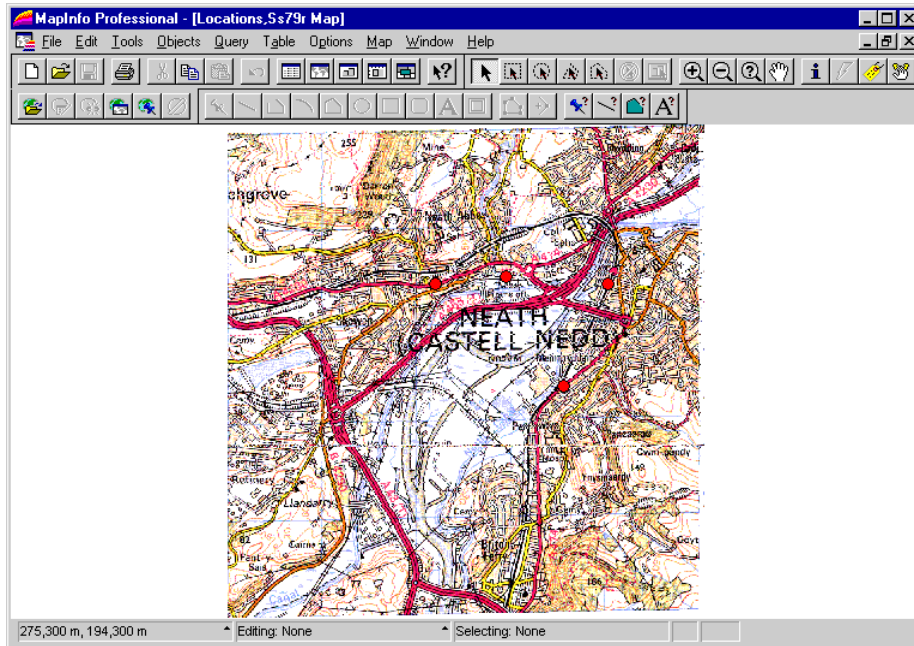Grid sources are not available in ADMS-Roads. ADMS-Roads users should skip this section.

How to create a grid source in MapInfo and export it to an Emissions Inventory

The MapInfo Emissions Inventory extension contains a useful tool for creating a grid source of total emissions from explicit sources that you have in an existing emissions inventory. This grid source can then be exported to an emissions inventory database.

Step 1 In MapInfo, ensure that the ADMS Emissions Inventory link is open, and select the emissions inventory database containing the source emissions data that you want to aggregate into a grid source.

Step 2 Display the sources you wish to aggregate into a grid source by selecting the appropriate layers from the Emissions menu. An example is shown in **Figure 6.17**, where a point source, a road source and an area source are displayed.
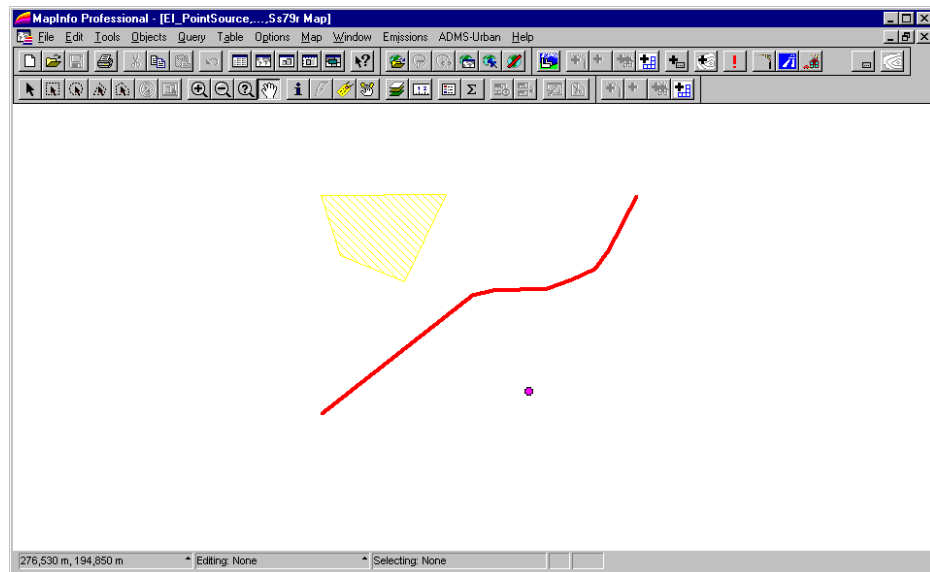
Figure 6.17 – A point, area and road source in MapInfo.

Step 3   Move the cursor over your data and make a note of the coordinates and extent of the grid source required to cover all your source data. In the case shown above, it turns out that the southwest corner of the grid source should be (272000,196000) and the grid should extend 3km east-west and 3km north-south.

In ADMS the extent of the grid source must be less than 60km from east to west and 60km from north to south.

Step 4   Select Aggregate As Grid Source... from the Emissions menu.

Step 5   Select the source layer that you wish to aggregate from the Aggregate emissions dialogue box, shown in **Figure 6.18**, and press Next >>. Only one layer may be aggregated at a time.
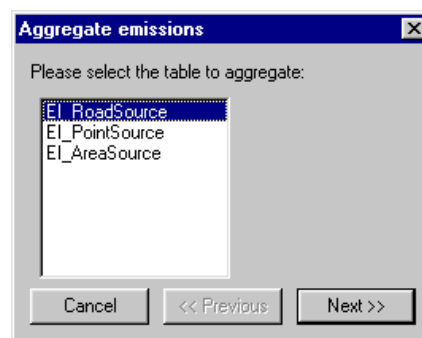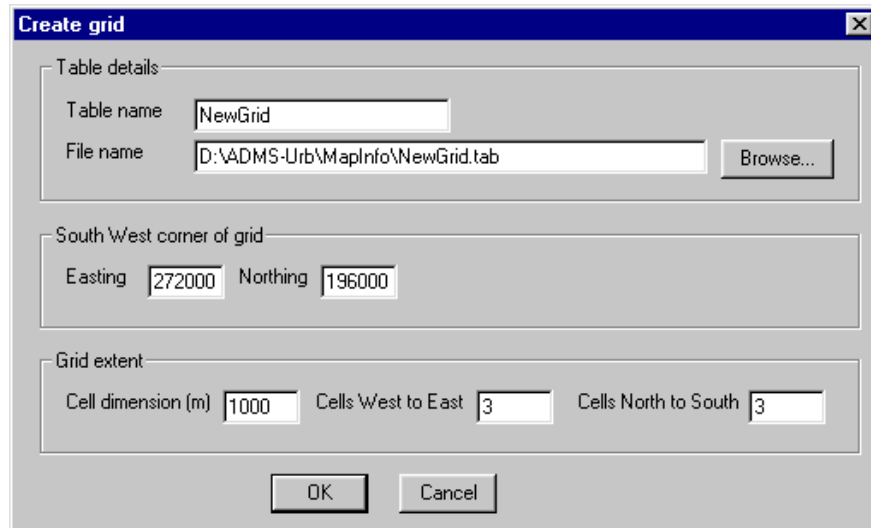

Figure 6.18 – Aggregate emissions dialogue box.

Step 6   You will now be prompted to select an existing grid table into which the source emissions will be aggregated (proceed to Step 8). At this stage, you can also use New... to create a new grid table (proceed to Step 7).
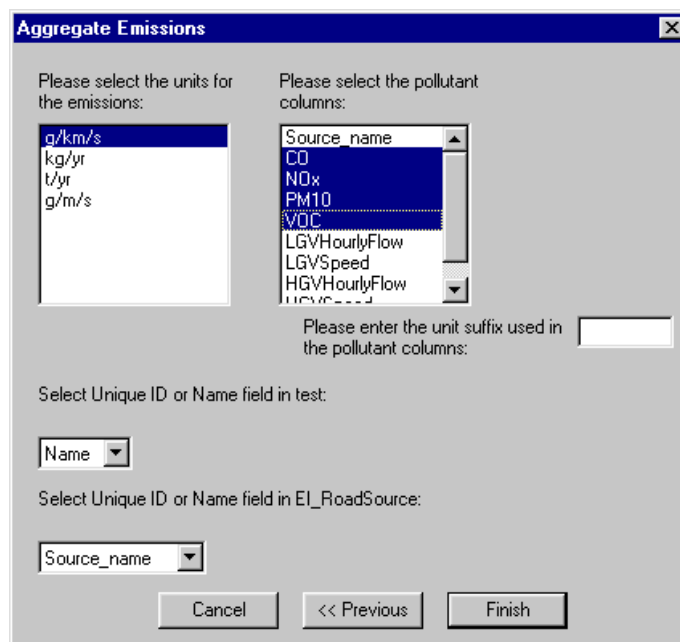
Figure 6.19 – Creating a new table.

Step 7   The Create grid dialogue box is shown in **Figure 6.19**. Give the new grid table a sensible name, and choose a filename and directory for the resulting *.tab* file using the Browse… button. Make sure the correct values are present for the coordinates of the southwest corner of the grid, the grid spacing and the number of cells required in the north and west directions. Press OK.

Figure 6.20 – Aggregate Emissions dialogue box.

Step 8   The Aggregate Emissions dialogue box is shown in **Figure 6.20**. Select the units for the emissions you wish to aggregate, and the pollutant column(s). If the pollutant names contain a unit suffix (this will be shown in the pollutant column box) then enter it in the appropriate box. Otherwise leave it blank. Ensure that a unique identification field has been identified for both the grid table and the source table. If you have sources which have the same name, for

example multiple sections of the same road, then you may have to add a column in the source table which contains a unique ID – this is required for aggregation

Step 9   Clicking on **Next >>** results in a new message. If the source contains zero or blank values for NO_X emissions but nonzero NO_2 values then the aggregation will assume that all NO_x is emitted as NO_2 and the dialogue box shown in **Figure 6.21** will appear; click **OK**.
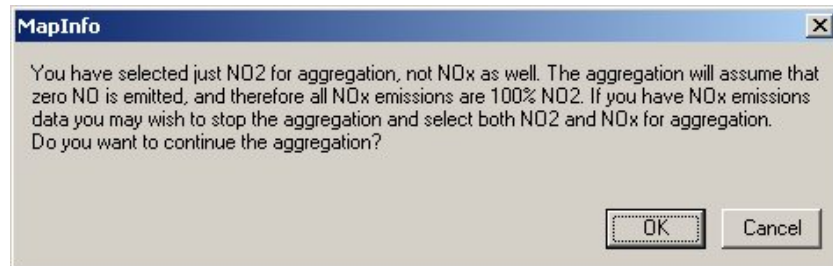

Figure 6.21 – Message about treatment of NOx emissions.

If the source contains NO_X emissions but no NO_2 emissions you will be asked to specify the percentage of NO_X that is emitted as NO_2. The format of the dialogue box that appears depends on the type of source that is being aggregated to the grid. **Figure 6.22** shows the format of the dialogue box for road sources. The format is the same for industrial sources except that the initial value shown for the percentage of NO_2 is 5%.

Specify the percentage of the NO_X that is NO_2, or alternatively use the default value provided. Then click OK.
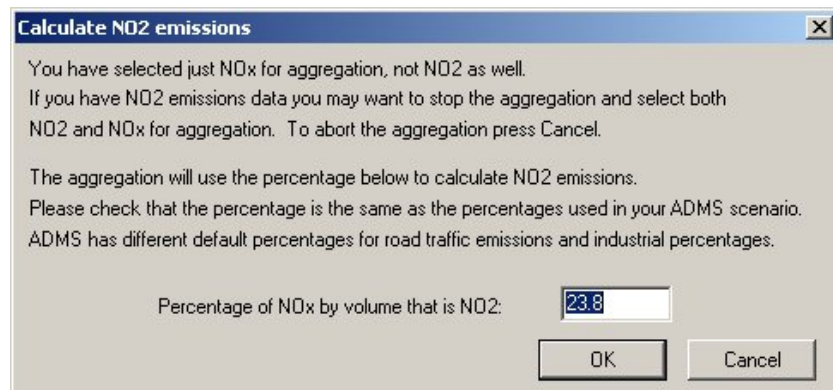
Figure 6.22 – Specifying percentage NO_x as NO_2.

See ADMS manual Appendix B for further information on the assumptions ADMS uses when modelling NO_X and NO_2.

Step 10   Select Depth Column dialogue box is shown in **Figure 6.23**. This will appear if you selected g/m³/s emissions units on the Aggregate Emissions dialogue box. The grid aggregation requires the vertical depths of the sources in metres. Choose the column that contains this data, and click Next >>.

Figure 6.23 – Select Depth Column dialogue box.

Step 11   MapInfo will then create the grid source, if necessary, and add the aggregated emissions from the source table you have selected. You will then be asked if you wish to display the new grid source in the current map window. Answer *Yes* to display the new grid source.

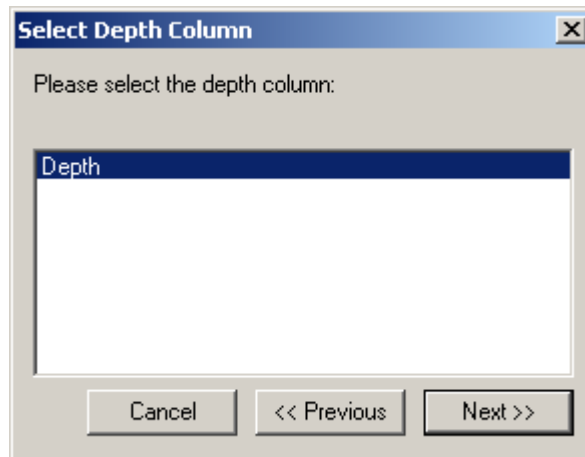**Step 12**   Repeat the steps from Step 4 to Step 10 for each source layer that you wish to aggregate into the grid source.

Step 13   The grid source you have created is now ready to export to the emissions inventory, as described below.

Exporting a grid source

If you have created a grid source as described in Step H, Section 6.3, or displayed a grid source from an existing emissions inventory as described in Step F, Section 6.1, click *Emissions, Export Grid Source to Emissions Inventory* to *export all the cells of the grid source* to an Emissions Inventory. You will be reminded that you should have no grid sources in the inventory database to which you are about to export.

Step 14   Select *Export Grid Source To Emissions Inventory*. The dialogue in **Figure 6.24** will appear.
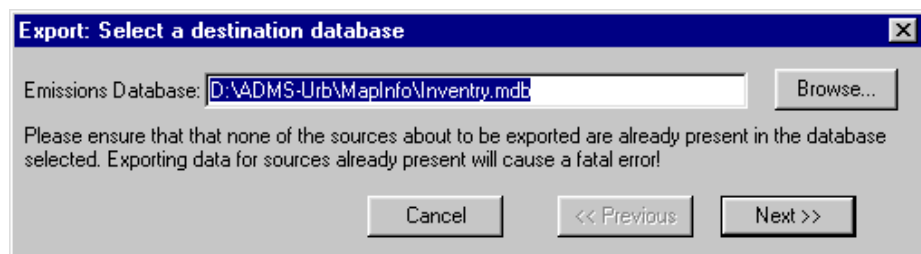

Figure 6.24 – Selection of destination database for exported grid

Step 15   Select the destination database to which you wish to export the grid source. The default option is the database you are already connected to. Press *Next >>*.

Figure 6.25 – Selection of grid table to be exported

Step 16 In the dialogue shown in **Figure 6.25**, select the grid source table that you wish to export and press Next >>.

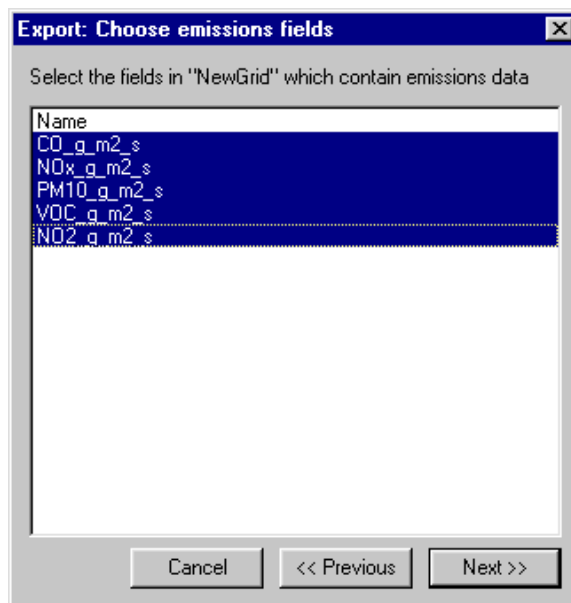**Figure 6.26** – Selection of emissions fields to be exported

Step 17 In the dialogue shown in **Figure 6.26**, select the emissions fields for the grid source and press Next >>. If NO_x and NO_2 emissions are present, it is important that both are selected for export. Note that in the example shown, NO_2 emissions have been created during aggregation, with emission levels calculated from the NO_x emissions.
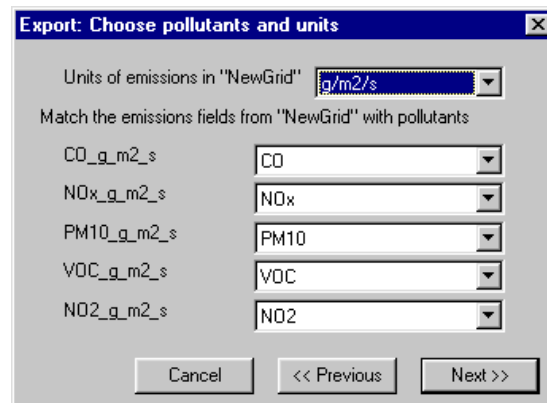
Figure 6.27 – Matching emissions fields to be exported with pollutants

Step 18   The next screen, as shown in **Figure 6.27**, prompts the user to ensure that the pollutant names have been correctly deduced from the table headings in MapInfo. The available list of pollutants is based on the list of pollutants defined in the Pollutants Palette in the ADMS interface. If you wish to use a non-standard pollutant, you must explicitly define it in the ADMS interface Pollutant Palette before attempting to export the emissions from MapInfo. When you are satisfied that the correct ADMS pollutant is chosen from the drop-down list for each emission heading, press Next >>.

Step 19   Finally, choose the grid source depth that you require, and press Finish to complete the export process.

Your grid source will be exported to the emissions inventory. Data for any grid source cells that already exist in the emissions inventory will not be over-written. A message warns the user if grid source cells already exist in the emissions inventory.

6.4   Step I – Exporting selected point, road, area, volume, line and grid source cells

MapInfo can be used to export selected emissions inventory sources, for instance those emitting above a certain threshold or those from a certain plant operator or lying within a certain area, to ADMS for modelling.

Before exporting data from MapInfo to ADMS users must make sure that both programs are using the same emissions inventory. In the ADMS interface select File, Preferences, Inventory Database..., and browse to locate the correct database.

In MapInfo clicking Emissions, Change database will show the emissions inventory being used currently.

Display the emissions inventory source data as explained in Section 6.1. Use the Select Feature Tool 🔲 in MapInfo to select the sources to be transferred from the emissions inventory to the ADMS Interface.

Only sources in the top layer will be selected. To select and export sources from other layers, first you must use the layer control button ![layer control button] *to move the required layer to the top position.*

In MapInfo click Emissions and Export Selected Sources to ADMS. The screen shown in **Figure 6.28** will be displayed. Follow the instructions outlined under Step C to select the pollutants to import. Click Next> when you have made your selection.
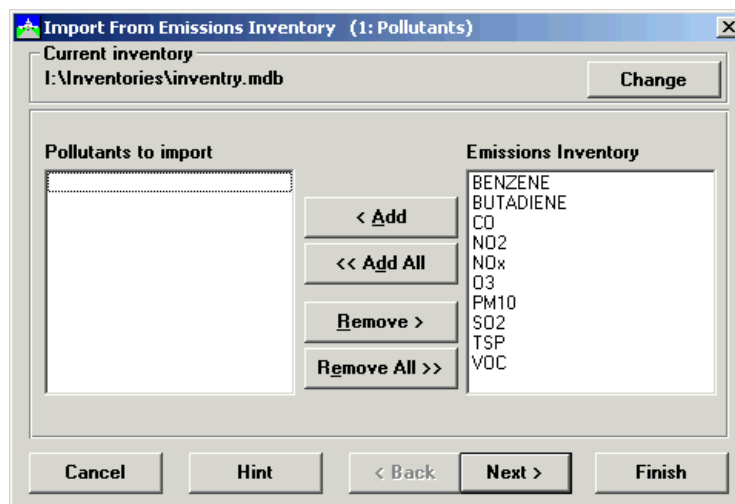

Figure 6.28 – The Import from Emissions Inventory (1: Pollutants) window.

The screen shown in **Figure 6.29** is then displayed.

The sources that you have selected in MapInfo are shown in the Sources to import box on the left of the screen. Sources listed in this box will be imported into the ADMS interface; those shown in the box on the right hand side will not.

If you decide not to import some of your sources that you have selected in MapInfo, click on Remove> to remove them from the Sources to import box. Alternatively, if you want to import sources from the emissions inventory that you have not already selected in MapInfo, these can be added to the Sources to import box by clicking on the <Add button. Click on Finish when you have made your selection.
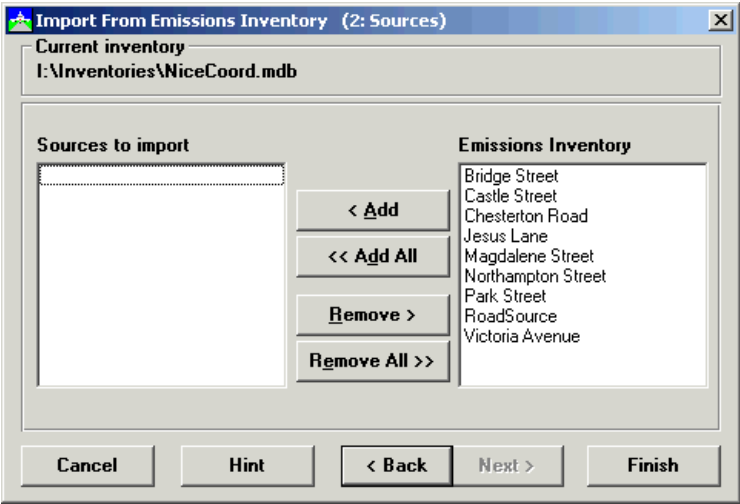
Figure 6.29 – The Import from Emissions Inventory (2:Sources) window.