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GIS AS A TOOL TO PRIORITIZE ENVIRONMENTAL RELEASES, INTEGRATE THEIR MANAGEMENT AND ALLEVIATE THEIR PUBLIC THREAT

Northeast Region
Wisconsin Department of Natural Resources (WDNR)

April, 1999

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INTRODUCTION

The Wisconsin Department of Natural Resources (WDNR) Northeast Region undertook this project with the thought that relevant volumes of geologic and hydrogeologic data was being gathered by the Bureau of Remediation and Redevelopment and left in paper format in file cabinets. Much of this information is relevant to current case work by others but is highly inaccessible. Due to office space limitations closed cases are often located in different locations than active cases, thus, relevant information to ongoing work is inaccessible. For example, case sites that are located near one another which have pertinent information and subsequently closed can not easily be referenced to assist in current matters. This project gathered relevant geologic and hydrogeologic data from case files and entered them in one single relational database. This database is joined in a Geographic Information System (GIS) with previously located site information. This combination provides an easily accessible wealth of information that can be used for queries and analysis. As an additional component in this project WDNR Northeast Region developed a program utilizing Environmental Systems Research Institute, Inc. (ESRI) developer programming language Avenue for ArcView. This program allows persons unfamiliar to GIS the ability to query all data the Region has gathered. For instance, the Bureau of Drinking Water and Groundwater has been creating a database of well logs in FileMkaerPro software. These well logs are linked in an ArcView project to be readily viewed by selecting an area on screen. The documentation/instructions for this program are found after the conclusion of this report. The project information is currently used by hydrogeologists in the Region to assist them in determining the characteristics of ongoing cases, also summary reports can be prepared of local conditions prior to investigating contamination sites in the field.

PROCEDURES

The WDNR Bureau of Remediation and Redevelopment monitors environmental spills, leaking underground storage tanks and landfills. Data is collected quarterly while the case is active and inserted into case files in paper format. This project researched active and closed cases looking for relevant geologic and hydrogeologic data. Information gathered consisted of LUST/ERRP case number, depth to bedrock, depth to water table, soil characteristics broken into five foot depths from the surface, hydraulic conductivity and site well number, and soil and water analytical results from upgradient borings and wells broken into five foot depths from the surface. Soil analytical results collected were reflective of naturally occurring earth materials. Case files were located throughout WDNR field offices in the Northeast Region. Multiple visits to each field office were required to complete the project. A sample project form (figure 1.) was completed as accurately and extensively as each case permitted.

Figure 2. is a map showing the location of sites where information existed that was recorded. There were 660 Leaking Underground Storage Tank (LUST) sites and 146 Environmental Repair and Restoration (ERRP) sites. Although there are many more contamination cases that existed in the region many cases did not have pertinent information, and others only had data collected for some portions of the form due to the extent of the contamination or the progress of the case. For instance, some cases only required soil sampling to determine the potential of contamination, if no soil contamination existed no further examination such as groundwater sampling was required. In this instance only soil characteristics could be gathered from the case. The files for most cases yielded depth to water and soil characteristic data. Research was also hampered by the fact that no two case reports were similar, files had to be carefully read to obtain accurate information regarding upgradient soil borings and groundwater well samples.

In many situations soil characteristics for environmental spill cases are not equally classified according to a strict system. The sample project form (figure 1.) illustrates the type of soil materials that many case records contained. This project used the Classification of Soils for Engineering Purposes (Table 1., Unified Soil Classification System) to better identify each soil. Using this well-known system allows a database query to be made by the classification

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Figure 1. Sample Project Form

ERRP Case # 566 [redacted] ☐ open ☒ closed

Depth to Water Table: 6 [redacted] Feet Below Ground Surface

Depth to Bedrock: [redacted] Feet Below Ground Surface

Materials (clay, silt, sand, gravel, etc.) average of all wells or specific to wells if necessary

		code
0 to 5 Ft.	silty clay (CL)	CL
5 to 10 Ft.	silty clay, with organic peat layer at 9.5 ft	CL
0 to 10 Ft.	> 10 ft. sand with trace of silt	SM

Hydraulic Conductivity (K in cm/sec)

Well #	Well #	Well #	Well #	Well #	Well#	Ref_Source

Contaminant	Well #	Soil (mg/kg)	GW Dissolved (ug/L filtered)	GW Total (ug/L unfiltered)
Nitrates				
Lead 0 to 5 ft.	B3	11.40		
5 to 10 ft.	B3	21.80		
Chrome 0 to 5 ft.	B3	39.20		
5 to 10 ft.	B3	36.70		
Arsenic 0 to 5 ft.	B3	4.36		
5 to 10 ft.	B3	3.81		
Cadmium 0 to 5 ft.	B3	0.26		
5 to 10 ft.	B3	0.59		
Selenium 0 to 5 ft.	B3	0.08		
5 to 10 ft.	B3	0.47		
Barium 0 to 5 ft.	B3	115.00		
5 to 10 ft.	B3	119.00		
Copper 0 to 5 ft.				
5 to 10 ft.				
Silver	B3 0-5	-0.33		
Mercury	B3 0-5	-0.13		

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Figure 2. Site Locations

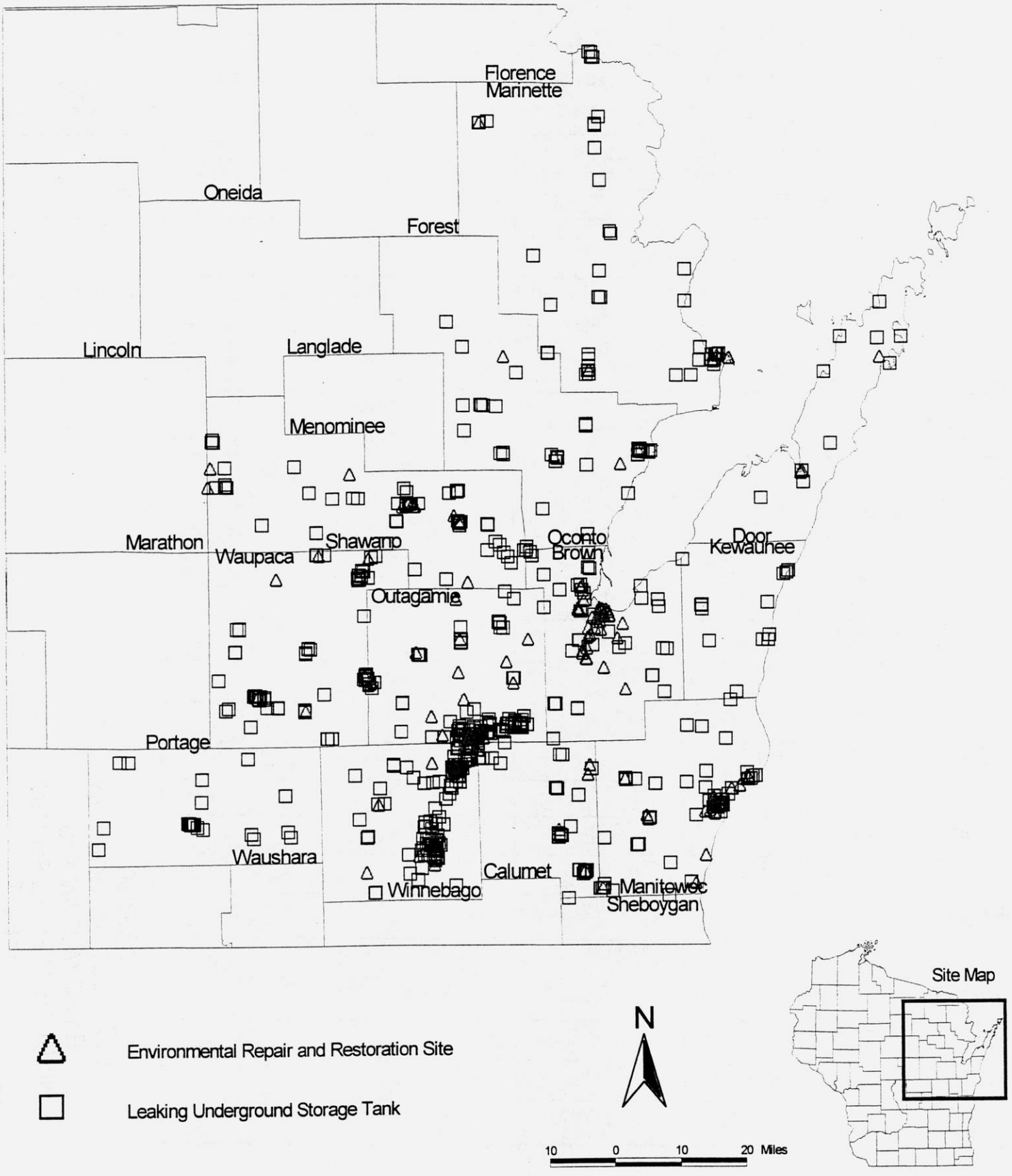
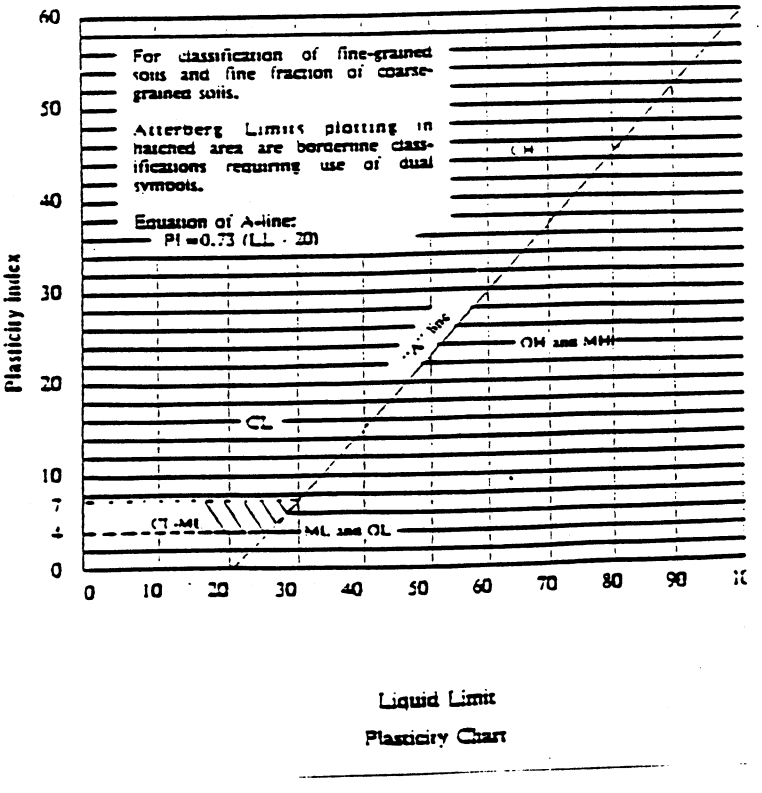


Table 1. Unified Soil Classification System

Major Divisions			Group symbols	Typical names	Laboratory classification criteria	
Coarse-grained soils (More than half of material is *larger* than No. 200 sieve size)	Gravels (More than half of coarse fraction larger than No. 4 sieve size)	Clean gravels (Little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines	Not meeting all gradation requirements for GW	
		Gravels with fines (Appreciable amount of fines)	GM d / u	Silty gravels, gravel-sand-silt mixtures	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are *borderline* cases requiring use of dual symbols
			GC	Clayey gravels, gravel-sand-clay mixtures	Atterberg limits above "A" line with P.I. greater than 7	
	Sands (More than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (Little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
			SP	Poorly graded sands, gravelly sands, little or no fines	Not meeting all gradation requirements for SW	
		Sands with fines (Appreciable amount of fines)	SM d / u	Silty sands, sand-silt mixtures	Atterberg limits below "A" line or P.I. less than 4	Limits plotting in hatched zone with P.I. between 4 and 7 are *borderline* cases requiring use of dual symbols
			SC	Clayey sands, sand-clay mixtures	Atterberg limits above "A" line with P.I. greater than 7	
Fine-grained soils (More than half of material is *smaller* than No. 200 sieve)	Silts and clays (Liquid limit less than 50)		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity		
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays		
			OL	Organic silts and organic silty clays of low plasticity		
	Silts and clays (Liquid limit greater than 50)		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts		
			CH	Inorganic clays of high plasticity, fat clays		
			OH	Organic clays of medium to high plasticity, organic silts		
Highly organic soils			Pt	Peat and other highly organic soils		

(Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:
Less than 5 per cent ..... GW, GP, SW, SP
More than 12 per cent ..... GM, GC, SM, SC
5 to 12 per cent ..... *Borderline* cases requiring dual symbols



Plasticity Chart

abbreviation. Interpretation was performed by the reviewer when the UCS code was not included in the description of the soil boring. Also when encountering analytical results in contamination reports a minimum detection level was frequently recorded as the result. This detection level is indicated in the table with a negative sign. Table 2 provides a description for each field in the table. The table has the field name with field type and the entry that may be allowed when entering data into the field. The entry limitations allow the reviewer the option of entering only certain types of information into a record. This entry option prohibits the reviewer from entering erroneous data into the table. The last column is a description of the field name, use this description as a guide when querying the database.

GIS and USES

Geographic Information System (GIS) allows the use of maps to be relationally joined to databases. The standard WDNR GIS software is Environmental Systems Research Institute (ESRI) ArcView software. This allows databases to be queried with results being displayed in mapped locations. The database that was collected during this project allows soil characteristics, hydraulic conductivity, depth to bedrock, depth to water table and background soil and water analytical results to be displayed spatially. An example would be to query all soil contamination locations where background arsenic levels were greater than 0.03 micrograms per liter. All relevant locations would then be highlighted in ArcView. Using the above example, Table 2 and the query builder tool in ArcView, the following statement {[As0_5W] > 0.03} or {[As5_10W] > 0.03} would yield the proper results. The user may zoom to an area of concern and select all the locations and print a summary report of conditions. These conditions reports are commonly done to identify indigenous metals concentrations to compare local background concentrations from site to site when evaluating case closure criteria relative to Natural Resources code NR720.19. soil requirements. An additional major use is the employment of this project to characterize petroleum site screening factors for sites to determine the division of caseloads between WDNR and Wisconsin Department of Commerce (WDOC). The most relevant screening factors include the presence of clay, hydraulic conductivity, and depth to bedrock. Additional site screening factors can be added as needed with future updates as they occur.

RECOMMENDATIONS

The following are possible suggestions that could be made to make this information more usable and provide guidance to future data collection.

* Currently the WDNR requires that consultants submit quarterly reports of samples taken in a tabular paper format. The WDNR should request e-mailed or computer disk copies in WDNR database supported formats of this same information which can easily be linked to currently located sites in a GIS environment.

* Along with the above information many contamination files have Autocad drawing files with detailed site drawings that can be joined to each site using hot-link features in ArcView GIS. Requests could be made to receive this information when submitting reports. All WDNR computers in receipt of such digital information would require adequate virus control software.

* Currently groundwater monitoring remediation wells are being computerized with an associated unique well identification number. A system should be developed that will link these computerized forms to the site GIS location. The groundwater monitoring well construction report should have a field where the contamination site unique identification number can be entered and/or all contamination sites located in GIS should have the corresponding unique well identification number(s) in a table for each well that has been drilled at the location. Thus information collected by outside contractors can be linked immediately within the GIS environment.

Table 2. Field Definitions

Field Name	Field Type	Formula / Entry Option	Description
ErrpLust	Text	Required Value	Contamination Type
Unique_id	Number	Only Allow Values of Type "Number"	Unique Field for Relating
Water_Depth	Number	Only Allow Values of Type "Number"	Water Depth
Bedrock_Depth	Number	Only Allow Values of Type "Number"	Bedrock Depth
Less_5	Text		Soil Description for 0 to 5 Ft.
UCS_0_5	Text		UCS Abbreviation for 0 to 5 Ft.
Five_to_Ten	Text		Soil Description for 5 to 10 Ft.
UCS_5_10	Text		UCS Abbreviation for 5 to 10 Ft.
Zero_to_Ten	Text		Soil Description for 0 to 10 Ft.
UCS_0_10	Text		UCS Abbreviation for 0 to 10 Ft.
Well1	Number	Only Allow Values of Type "Number"	Monitoring Well Number on Site
Well2	Number	Only Allow Values of Type "Number"	Monitoring Well Number on Site
Well3	Number	Only Allow Values of Type "Number"	Monitoring Well Number on Site
Well4	Number	Only Allow Values of Type "Number"	Monitoring Well Number on Site
Well5	Number	Only Allow Values of Type "Number"	Monitoring Well Number on Site
Well6	Number	Only Allow Values of Type "Number"	Monitoring Well Number on Site
K1	Number	Only Allow Values of Type "Number"	Hydraulic Conductivity for Corresponding Above Well
K2	Number	Only Allow Values of Type "Number"	Hydraulic Conductivity for Corresponding Above Well
K3	Number	Only Allow Values of Type "Number"	Hydraulic Conductivity for Corresponding Above Well
K4	Number	Only Allow Values of Type "Number"	Hydraulic Conductivity for Corresponding Above Well
K5	Number	Only Allow Values of Type "Number"	Hydraulic Conductivity for Corresponding Above Well
K6	Number	Only Allow Values of Type "Number"	Hydraulic Conductivity for Corresponding Above Well
Ref_Source	Text		If Hydraulic Conductivity Estimated
No3W	Number	Only Allow Values of Type "Number"	Nitrates Well Number
Pb0_5W	Number	Only Allow Values of Type "Number"	Lead Well Number
Pb5_10W	Number	Only Allow Values of Type "Number"	Lead Well Number
Cr0_5W	Number	Only Allow Values of Type "Number"	Chromium Well Number
Cr5_10W	Number	Only Allow Values of Type "Number"	Chromium Well Number
As0_5W	Number	Only Allow Values of Type "Number"	Arsenic Well Number
As5_10W	Number	Only Allow Values of Type "Number"	Arsenic Well Number
Cd0_5W	Number	Only Allow Values of Type "Number"	Cadmium Well Number
Cd5_10W	Number	Only Allow Values of Type "Number"	Cadmium Well Number

Field Name	Field Type	Formula / Entry Option	Description
Se0_5W	Number	Only Allow Values of Type "Number"	Selenium Well Number
Se5_10W	Number	Only Allow Values of Type "Number"	Selenium Well Number
Ba0_5W	Number	Only Allow Values of Type "Number"	Barium Well Number
Ba5_10W	Number	Only Allow Values of Type "Number"	Barium Well Number
Cu0_5W	Number	Only Allow Values of Type "Number"	Copper Well Number
Cu5_10W	Number	Only Allow Values of Type "Number"	Copper Well Number
OtherW	Number	Only Allow Values of Type "Number"	Other Well Number
NoS	Number	Only Allow Values of Type "Number"	Nitrates Soil Boring Results
Pb0_5S	Number	Only Allow Values of Type "Number"	Lead Soil Boring Results
Pb5_10S	Number	Only Allow Values of Type "Number"	Lead Soil Boring Results
Cr0_5S	Number	Only Allow Values of Type "Number"	Chromium Soil Boring Results
Cr5_10S	Number	Only Allow Values of Type "Number"	Chromium Soil Boring Results
As0_5S	Number	Only Allow Values of Type "Number"	Arsenic Soil Boring Results
As5_10S	Number	Only Allow Values of Type "Number"	Arsenic Soil Boring Results
Cd0_5S	Number	Only Allow Values of Type "Number"	Cadmium Soil Boring Results
Cd5_10S	Number	Only Allow Values of Type "Number"	Cadmium Soil Boring Results
Se0_5S	Number	Only Allow Values of Type "Number"	Selenium Soil Boring Results
Se5_10S	Number	Only Allow Values of Type "Number"	Selenium Soil Boring Results
Ba0_5S	Number	Only Allow Values of Type "Number"	Barium Soil Boring Results
Ba5_10S	Number	Only Allow Values of Type "Number"	Barium Soil Boring Results
Cu0_5S	Number	Only Allow Values of Type "Number"	Copper Soil Boring Results
Cu5_10S	Number	Only Allow Values of Type "Number"	Copper Soil Boring Results
OtherS	Number	Only Allow Values of Type "Number"	Other Soil Boring Results
No3Fil	Number	Only Allow Values of Type "Number"	Nitrates Filtered Groundwater Results
Pb0_5Fil	Number	Only Allow Values of Type "Number"	Lead Filtered Groundwater Results
Pb5_10Fil	Number	Only Allow Values of Type "Number"	Lead Filtered Groundwater Results
Cr0_5Fil	Number	Only Allow Values of Type "Number"	Chromium Filtered Groundwater Results
Cr5_10Fil	Number	Only Allow Values of Type "Number"	Chromium Filtered Groundwater Results
As0_5Fil	Number	Only Allow Values of Type "Number"	Arsenic Filtered Groundwater Results
As5_10Fil	Number	Only Allow Values of Type "Number"	Arsenic Filtered Groundwater Results
Cd0_5Fil	Number	Only Allow Values of Type "Number"	Cadmium Filtered Groundwater Results
Cd5_10Fil	Number	Only Allow Values of Type "Number"	Cadmium Filtered Groundwater Results
Se0_5Fil	Number	Only Allow Values of Type "Number"	Selenium Filtered Groundwater Results
Se5_10Fil	Number	Only Allow Values of Type "Number"	Selenium Filtered Groundwater Results

Field Name	Field Type	Formula / Entry Option	Description
Ba0_5Fil	Number	Only Allow Values of Type "Number"	Barium Filtered Groundwater Results
Ba5_10Fil	Number	Only Allow Values of Type "Number"	Barium Filtered Groundwater Results
Cu0_5Fil	Number	Only Allow Values of Type "Number"	Copper Filtered Groundwater Results
Cu5_10Fil	Number	Only Allow Values of Type "Number"	Copper Filtered Groundwater Results
Other_Fil	Number	Only Allow Values of Type "Number"	Other Filtered Groundwater Results
No3Unfil	Number	Only Allow Values of Type "Number"	Nitrates Unfiltered Groundwater Results
Pb0_5Unfil	Number	Only Allow Values of Type "Number"	Lead Unfiltered Groundwater Results
Pb5_10Unfil	Number	Only Allow Values of Type "Number"	Lead Unfiltered Groundwater Results
Cr0_5Unfil	Number	Only Allow Values of Type "Number"	Chromium Unfiltered Groundwater Results
Cr5_10Unfil	Number	Only Allow Values of Type "Number"	Chromium Unfiltered Groundwater Results
As0_5Unfil	Number	Only Allow Values of Type "Number"	Arsenic Unfiltered Groundwater Results
As5_10Unfil	Number	Only Allow Values of Type "Number"	Arsenic Unfiltered Groundwater Results
Cd0_5Unfil	Number	Only Allow Values of Type "Number"	Cadmium Unfiltered Groundwater Results
Cd5_10Unfil	Number	Only Allow Values of Type "Number"	Cadmium Unfiltered Groundwater Results
Se0_5Unfil	Number	Only Allow Values of Type "Number"	Selenium Unfiltered Groundwater Results
Se5_10Unfil	Number	Only Allow Values of Type "Number"	Selenium Unfiltered Groundwater Results
Ba0_5Unfil	Number	Only Allow Values of Type "Number"	Barium Unfiltered Groundwater Results
Ba5_10Unfil	Number	Only Allow Values of Type "Number"	Barium Unfiltered Groundwater Results
Cu0_5Unfil	Number	Only Allow Values of Type "Number"	Copper Unfiltered Groundwater Results
Cu5_10Unfil	Number	Only Allow Values of Type "Number"	Copper Unfiltered Groundwater Results
Other_Unfil	Number	Only Allow Values of Type "Number"	Other Unfiltered Groundwater Results

ACQUIRING DATA

The Northeast Region distributes the information gathered in this report in a variety of formats. The data is available by 3.5" floppy disks or over the WDNR network system. Hardware requirements for this data are within current minimum requirements for all WDNR computers. Software used to access this information is also installed on all machines. dBase files can be directly imported in MS Access. The data consists of the original FileMakerPro database, two databases, and two ArcView shapefiles named and described by the following:

PROJECT.fp3 - The original project site information form and database.

ERRP.dbf - This is an export and subset of the PROJECT.fp3 database consisting of a dBase file of site characteristics for Environmental Repair and Restoration Program sites.

LUST.dbf - This is an export and subset of the PROJECT.fp3 database consisting of a dBase file of site characteristics for Leaking Underground Storage Tank Program sites.

ERRP.shp
ERRP.dbf - Arcview shapefile of Environmental Repair and Restoration Program locations.
ERRP.shx

LUST.shp
LUST.dbf - ArcView shapefile of Leaking Underground Storage Tank Program locations.
LUST.shx

Both shapefiles contain the appropriate database joined to each and are referenced to the Wisconsin Transverse Mercator North Amercian Datum 83(91)(WTM83(91)) complying with WDNR BEITA\GEO standards.

CONCLUSIONS

The information collected is beneficial for many uses. This project fostered the retrieval of data from closed and soon to be closed case files that soon may be archived. The project has taken relevant data from generally inaccessible locations throughout the WDNR NER and made it available to be used currently in making decisions. During the course of the project ranking of WDNR case files by environmental severity was drastically altered and partially eliminated as the agency went through a reorganization and portions of the Leaking Underground Storage Tank program were transferred to another state agency (Wisconsin Department of Commerce). Thus case ranking by environmental factors was not addressed within the project. However the database created by this project enables a rapid determination of native site conditions on a local and regional scale where good data exists. Future updates of this information will enable rapid and accurate determinations of native environmental conditions in areas where human impacts may be likely.

Perhaps the greatest utility of this project has been the creation of the GIS query program utilizing ArcView. The development of this program and use of its final product has allowed the WDNR Drinking Water and Remediation and Redevelopment Programs to transition more efficiently toward a GIS digital site locating and information retrieval system. Both programs through Safe Drinking Water Requirements and Brownfield Initiatives respectively are incorporating GIS methods into their data systems. The GIS knowledge and developed methods ensued from this project provided the basis and training platform for the initiation of a coordinated statewide effort to integrate site information and provide access by unfamiliar GIS users.

USING AVENUE and ARCVIEW for DATA ANALYSIS

The Northeast Region has designed a project using ESRI's developer programming language Avenue for ArcView. Avenue is the programming language that com/es packaged with ArcView, it allows customization and a development environment for ArcView. Throughout the course of the project the Northeast Region developed a program that will allow unfamiliar and inexperienced users of ArcView the ability to query all data the Northeast Region has gathered using GIS data gathered from previous years.

The following documentation has provided inexperienced and unfamiliar users the ability to access accumulated groundwater data collected throughout the region.

Figure 1. This is the opening window that appears when the project is open. A button has been added that will allow the program to be run.

Figure 2. A customary welcome message appears stating the project has started.

Figure 3. A drop down menu will appear that will allow the user to select a county that data has been collected from. Brown county has been selected for this example.

Figure 4. A progress message will appear stating the county which has been selected.

Figure 5. An option menu box can also be selected that will allow the user to add additional statewide data layers that have been provided by the WDNR BEITA/GEO team. These layers include County, Municipal, Watershed, Basin Boundaries, plus other information. The user has the option if they want to select these layers now or they can be added later if needed.

Figure 6. The view has added the base layers (roads, hydrology, and wetlands) of the county selected. Only roads will be visible until a method has been selected to zoom to the area of interest. A prompt will appear that allows the user to select a way to zoom to the area of interest. Method 1 will ask for the Public Land Survey System (PLSS) Coordinates (town, range, section, ¼, ¼ section). Method 2 will zoom to the area of interest by drawing a box around the area of interest. This is used when PLSS Coordinates are unknown.

Figure 7. In this example the user has selected the PLSS coordinates a message box will appear that prompts the user to enter the PLSS description. Also contamination source data layers have been added to the view. Entering the coordinates will allow the user to zoom to the area with a one mile radius extent.

Figure 8. When the area of interest has been zoomed to another pop-up menu will prompt the user to select a point to search from and enter a radius for the user to search for contamination sources around it.

Figure 9. The search will then label all contamination sources with a representative unique identification number that will match a spreadsheet printout the user is prompted to print if desirable.

The above documentation allows the user to gather data that is frequently requested by a variety of customers. The following documentation allows users the ability to access more detailed records from the WDNR.

Figure 10. Also in this project various buttons have been added that will allow users to obtain information from other databases.

Figure 11. The W button will allow users to add well locations from the well database source of FilemakerPro that contains well construction reports. When the W is pressed all known well locations from the software will be added to ArcView a box can be drawn on the view and FilemakerPro will start automatically and locate the selected wells from the view.

Figure 12. This is an example of the well log that was selected from the ArcView project.

Figure 13. You may also query records from FilemakerPro to select records displayed in ArcView.

Figure 14. Due to the number of wells in the database this figure does not show a representation of the records selected.

Figure 15. Depressing the Q button will load 7.5 Minute Topographic maps (DRGs) this will allow the user to view additional information including contours for the area of interest.

Figure 16. Selecting the red pennant will bring up a pop-up menu that will allow the user to select base layer information for an additional county. This button is useful if the area of interest borders two or more counties.

Figure 17. Depressing the S button will allow the user to add statewide data layers from a pop-up menu.

Figure 18. Pressing the M button will send the current view to a map layout where the map will be printed.

Figure 19. Selecting the link button will display a pop-up menu that will ask you to select a LUST or ERRP database to link to contamination sites.

Figure 20. After selecting a database a pop-up menu will appear that allow you to further select the category of information you would like to link to contamination sites. The options include an impact, priority or substance table.

Figure 21. In this example the impact table was selected and a further pop-up menu will query you to select the the type of impact.

Figure 22. The link table has been added and another prompt will ask if you would like to add additional tables.

Figure 23. In this example no additional tables were selected and the view highlights ERRP sites that have known groundwater contamination.

Figure 24. Selecting the D button will result in a pop-up menu that allows the user to select other projects specialized projects that contain information collected in the Northeast Region. The Branch River Priority Watershed Project has been selected.

Figure 25. Once a project has been selected a menu will appear that will ask if you like to delete the current features or they may be saved for further use.

Figure 26. Branch River Priority Watershed potential contaimnation sources will be displayed.

Figure 27. Using a combination of previously discussed buttons will display topographic maps and watershed boundaries. Highlighting the selected features will result in tables to be displayed.

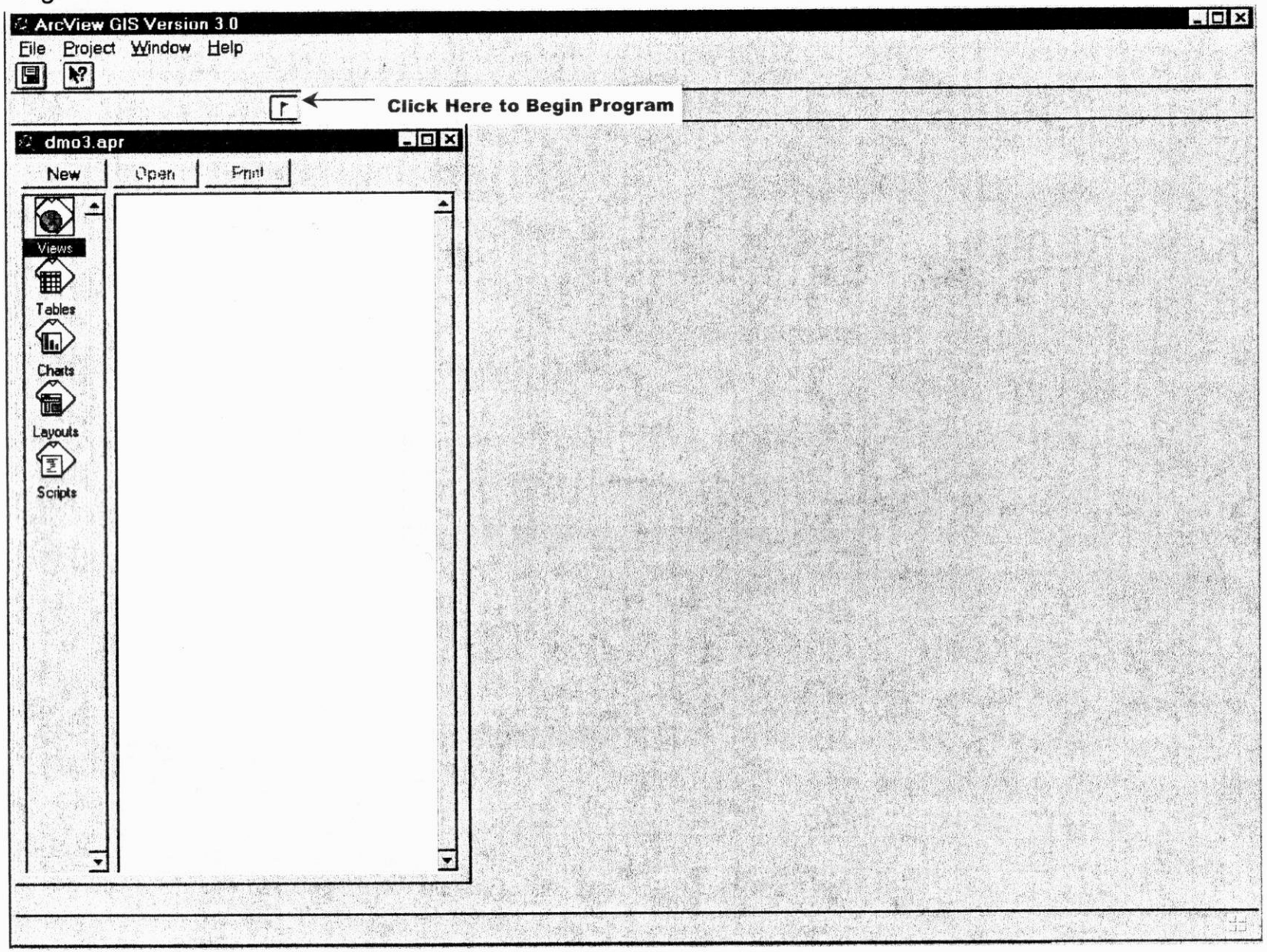
Figure 28. Pressing the D button again will prompt to select another project. This example will select the Oshkosh\Keeneville water sampling results project.

Figure 29. Once again querying some of the selected sites will result in water quality results for a sampled area.

The above project has allowed the inexperienced GIS user to query and obtain knowledge on a specific area that can provide additional help to better serve customers.

Rick,

Figure 1.


ArcView GIS Version 3.0
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Click Here to Begin Program
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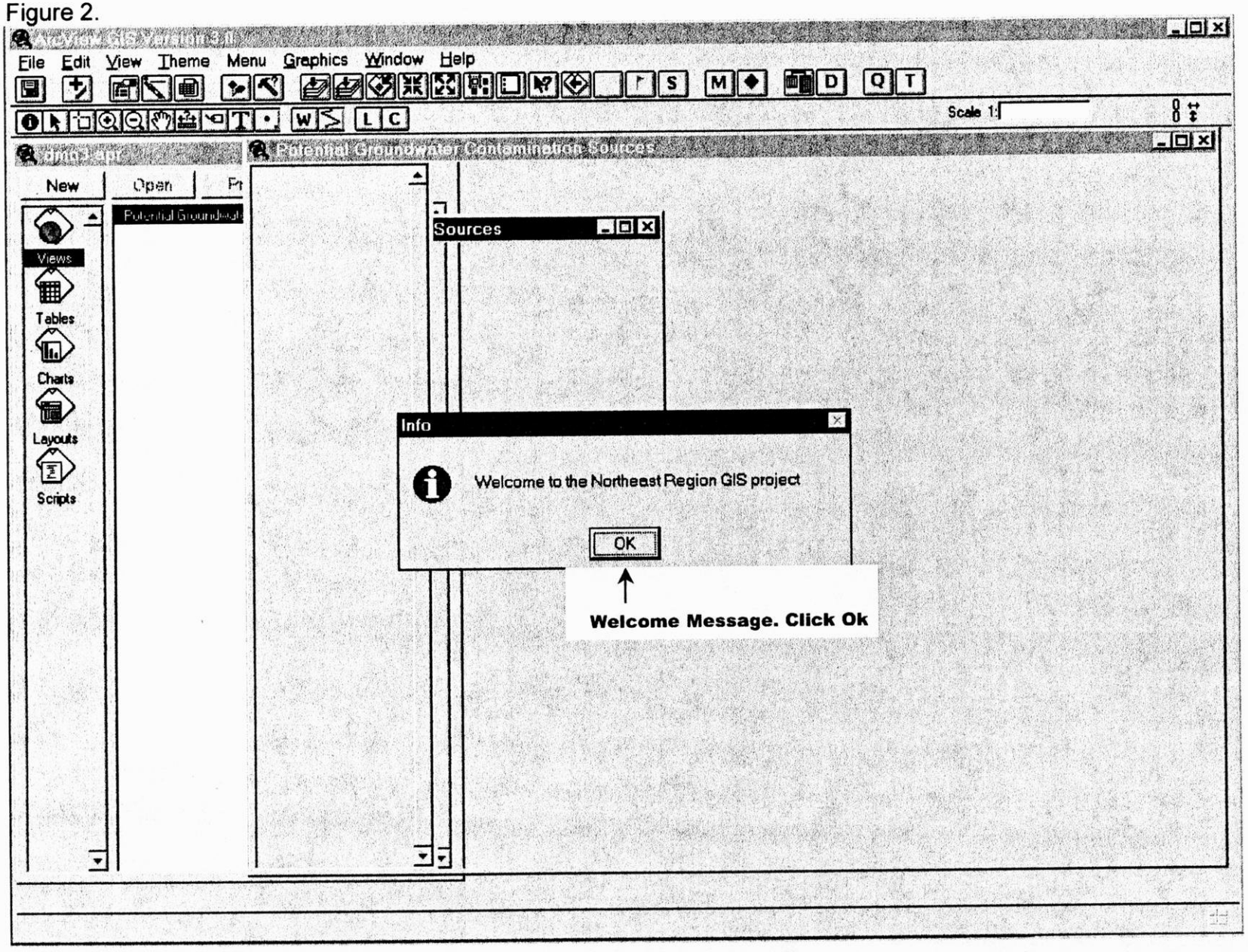
New
Open
Print
Views
Tables
Charts
Layouts
Scripts

Figure 2.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New
Open
Views
Tables
Charts
Layouts
Scripts
Potential Groundwater Contamination Sources
Sources
Info
Welcome to the Northeast Region GIS project
OK
Welcome Message. Click Ok

Figure 3.

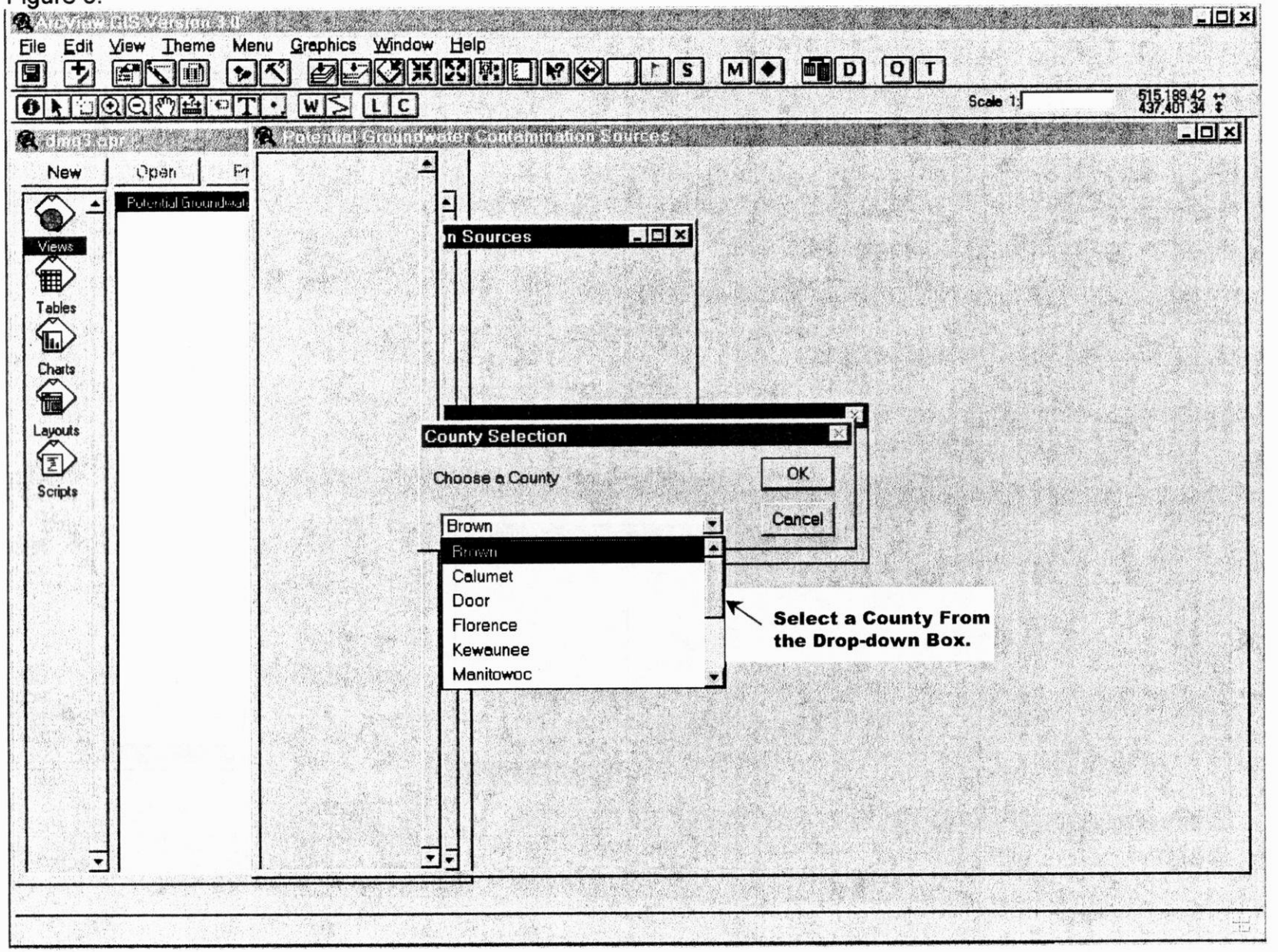

File Edit View Theme Menu Graphics Window Help
Scale 1:
515,189.42
437,401.34
New
Open
Views
Tables
Charts
Layouts
Scripts
Potential Groundwater Contamination Sources
n Sources
County Selection
Choose a County
OK
Cancel
Brown
Brown
Calumet
Door
Florence
Kewaunee
Manitowoc
Select a County From the Drop-down Box.

Figure 4.

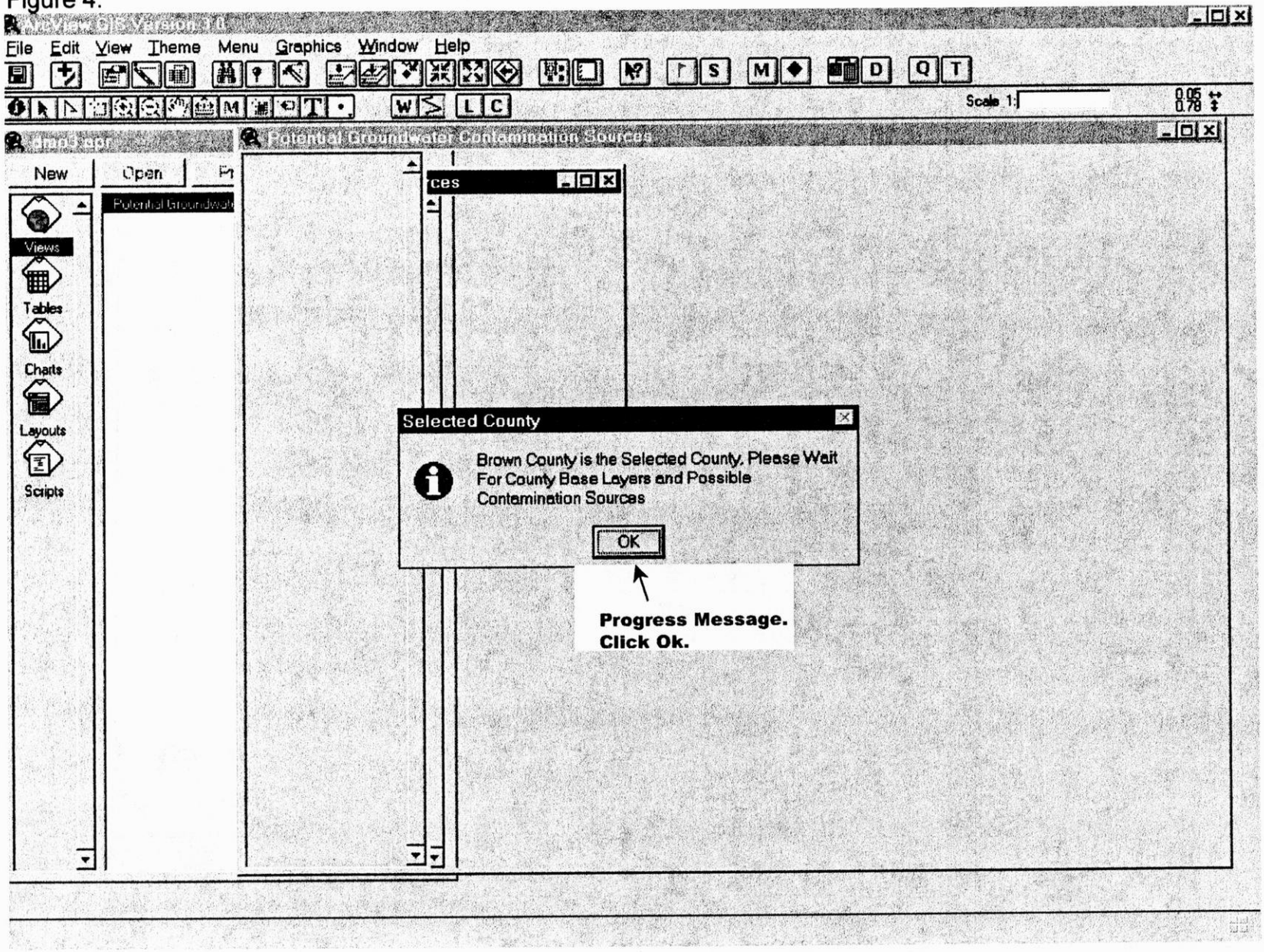

File Edit View Theme Menu Graphics Window Help
Scale 1:
New
Open
Views
Tables
Charts
Layouts
Scripts
Potential Groundwater Contamination Sources
Selected County
Brown County is the Selected County. Please Wait For County Base Layers and Possible Contamination Sources
OK
Progress Message. Click Ok.

Figure 5.

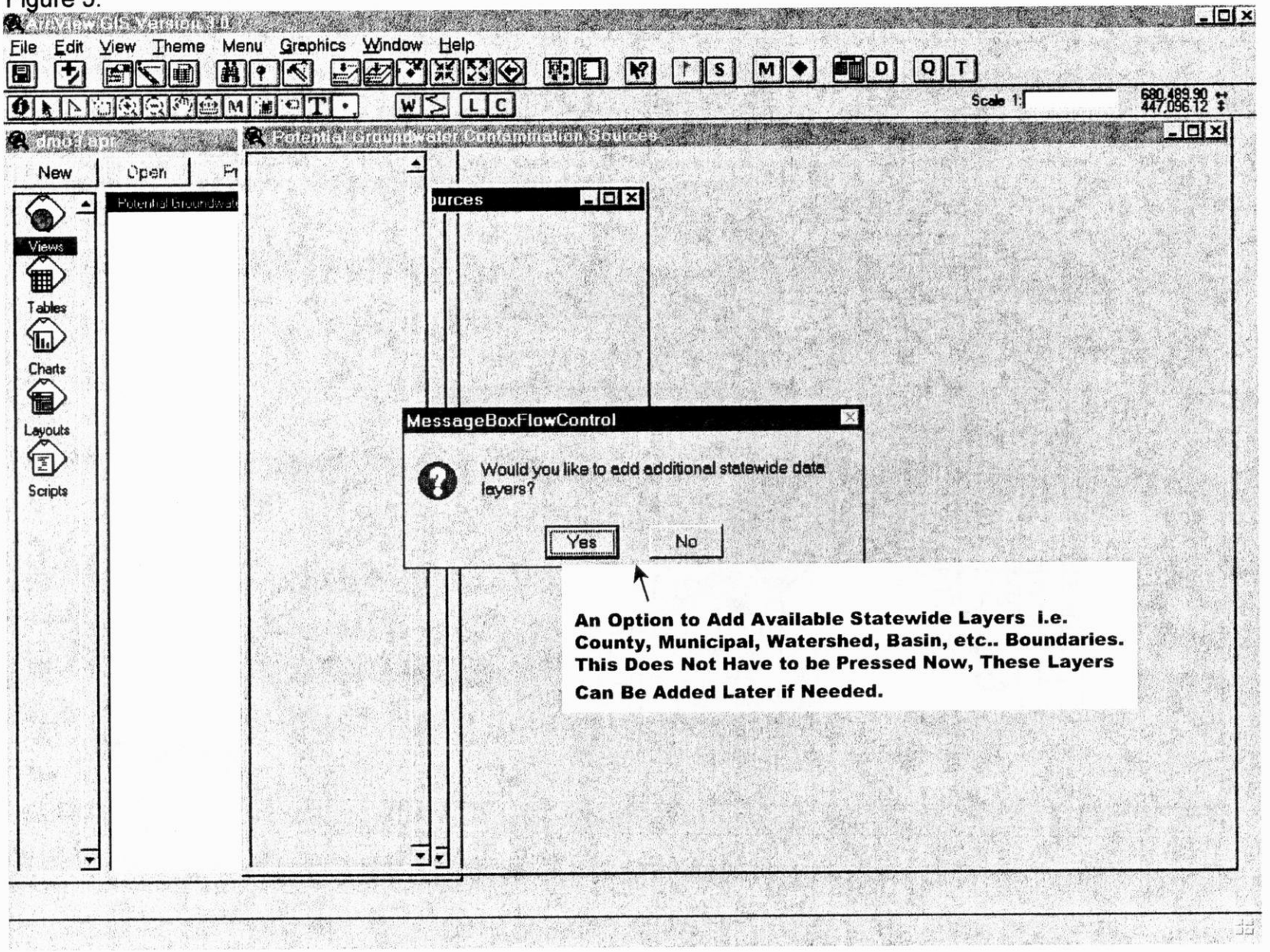

File Edit View Theme Menu Graphics Window Help
Scale 1:
680,489.90
447,096.12
New
Open
Views
Tables
Charts
Layouts
Scripts
Potential Groundwater Contamination Sources
MessageBoxFlowControl
Would you like to add additional statewide data layers?
Yes
No
An Option to Add Available Statewide Layers i.e. County, Municipal, Watershed, Basin, etc.. Boundaries. This Does Not Have to be Pressed Now, These Layers Can Be Added Later if Needed.

Figure 6.

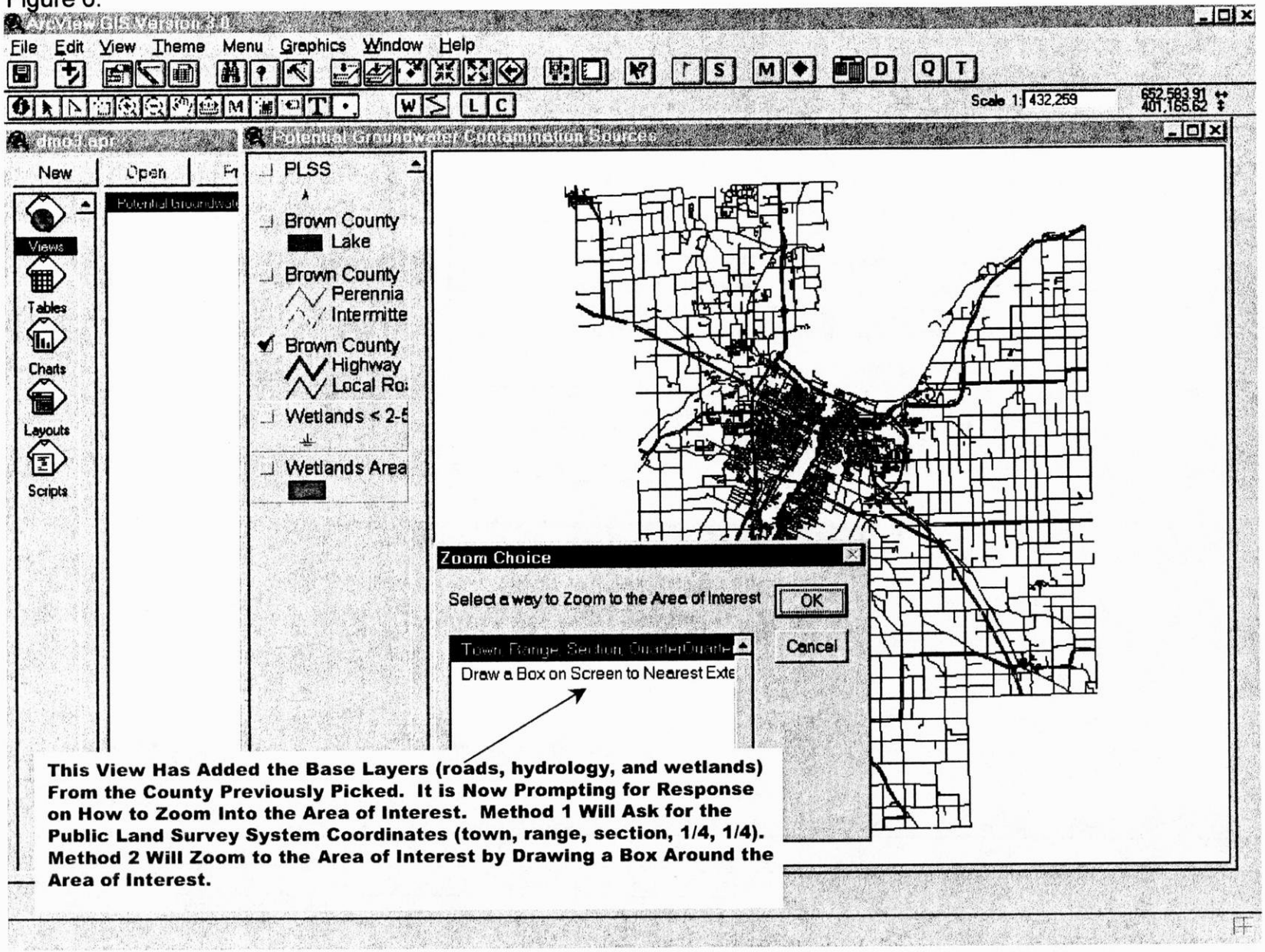

ArcView GIS Version 3.1
File Edit View Theme Menu Graphics Window Help
Scale 1: 432,259
652,583.91
401,165.62
New
Open
Views
Tables
Charts
Layouts
Scripts
Potential Groundwater Contamination Sources
PLSS
Brown County Lake
Brown County Perennia Intermitte
Brown County Highway Local Ro
Wetlands < 2-5
Wetlands Area
Zoom Choice
Select a way to Zoom to the Area of Interest
OK
Cancel
Draw a Box on Screen to Nearest Exte
This View Has Added the Base Layers (roads, hydrology, and wetlands) From the County Previously Picked. It is Now Prompting for Response on How to Zoom Into the Area of Interest. Method 1 Will Ask for the Public Land Survey System Coordinates (town, range, section, 1/4, 1/4). Method 2 Will Zoom to the Area of Interest by Drawing a Box Around the Area of Interest.

Figure 7.

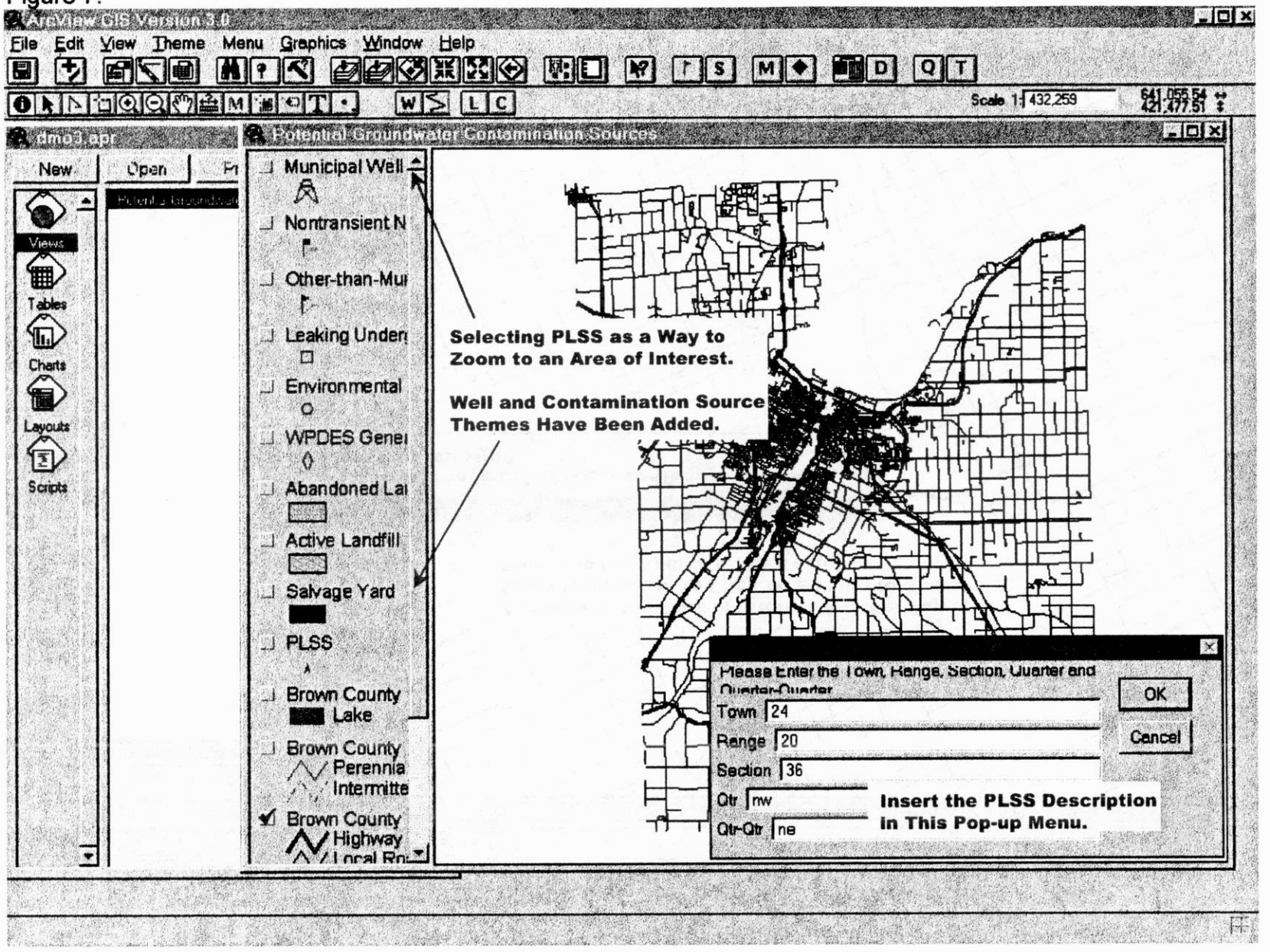

ArcView GIS Version 3.0
File Edit View Theme Menu Graphics Window Help
Scale 1: 432,259
dmo3.apr
New
Open
Views
Tables
Charts
Layouts
Scripts
Potential Groundwater Contamination Sources
Municipal Well
Nontransient N
Other-than-Mu
Leaking Under
Environmental
WPDES Gene
Abandoned La
Active Landfill
Salvage Yard
PLSS
Brown County Lake
Brown County Perennia Intermitte
Brown County Highway
Selecting PLSS as a Way to Zoom to an Area of Interest.
Well and Contamination Source Themes Have Been Added.
Please Enter the Town, Range, Section, Quarter and Quarter-Quarter
Town 24
Range 20
Section 36
Qtr nw
Qtr-Qtr ne
OK
Cancel
Insert the PLSS Description in This Pop-up Menu.

Figure 8.


ArcView GIS Version 3.0
File Edit View Theme Menu Graphics Window Help
Scale 1: 30,297
659,043.60
429,810.61
dmo3.apr
New
Open
Views
Tables
Charts
Layouts
Scripts
Potential Groundwater Contamination Sources
Municipal Well
Nontransient N
Other-than-Mul
Leaking Unden
Environmental
WPDES Ge
Abandoned
Active Land
Salvage Yard
Brown County Lake
Brown County Perennia Intermitte
Brown County Highway Local Ro
Wetlands < 2-5
Zooming to the Area of Interest Another Pop-up Menu Will Prompt to Click on a Place to Search From and the Radius of the Search.
Radius Definition
Click on a Center Point then, Select a Radius in Feet For Your Search
OK
Cancel
5280

Figure 9.

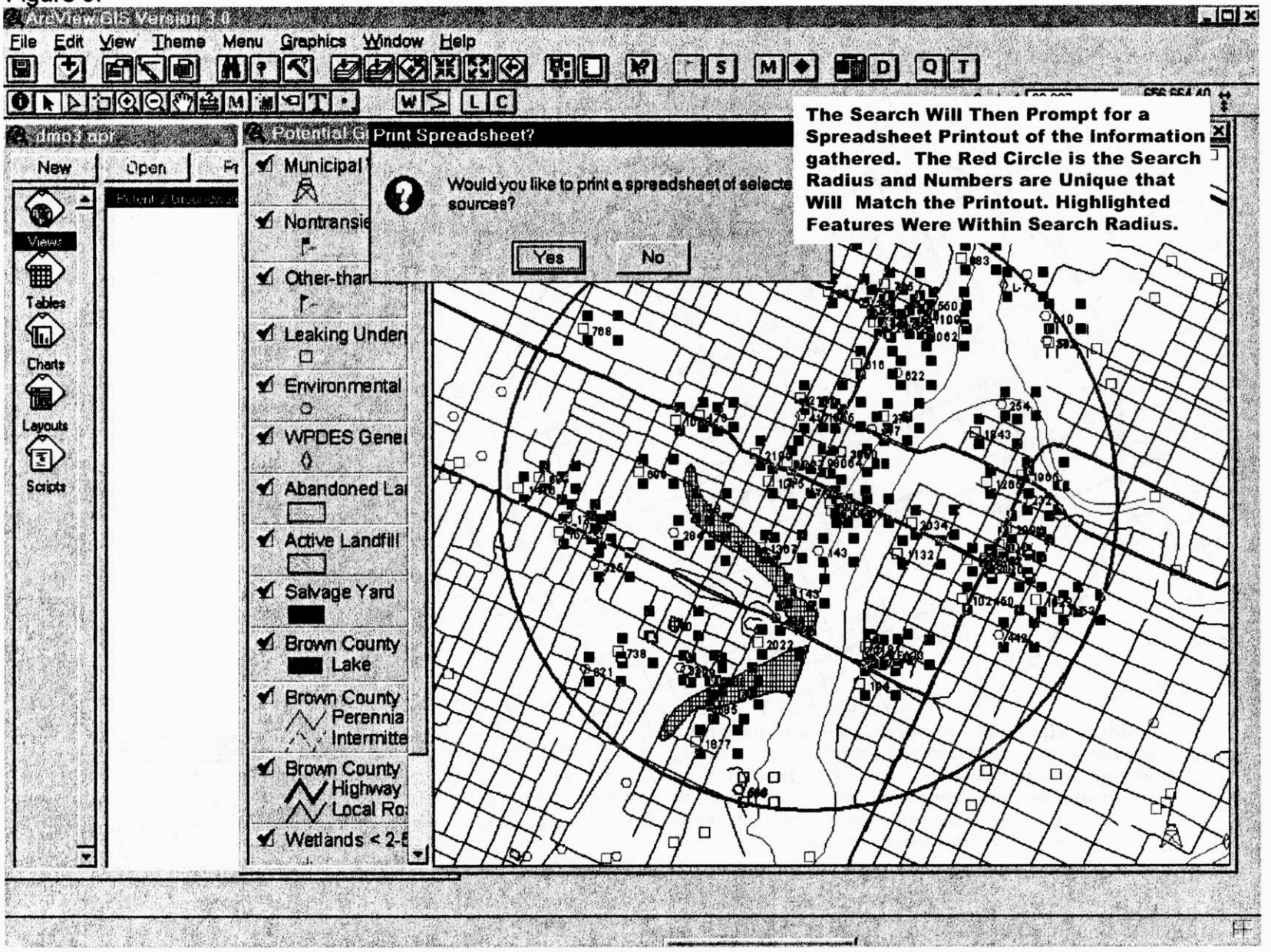

ArcView GIS Version 3.0
File Edit View Theme Menu Graphics Window Help
New
Open
Views
Tables
Charts
Layouts
Scripts
Print Spreadsheet?
Would you like to print a spreadsheet of selecte
sources?
Yes
No
Municipal
Nontransie
Other-thar
Leaking Under
Environmental
WPDES Gener
Abandoned La
Active Landfill
Salvage Yard
Brown County
Lake
Brown County
Perennia
Intermitte
Brown County
Highway
Local Ro
Wetlands < 2-
The Search Will Then Prompt for a Spreadsheet Printout of the Information gathered. The Red Circle is the Search Radius and Numbers are Unique that Will Match the Printout. Highlighted Features Were Within Search Radius.

Figure 10.

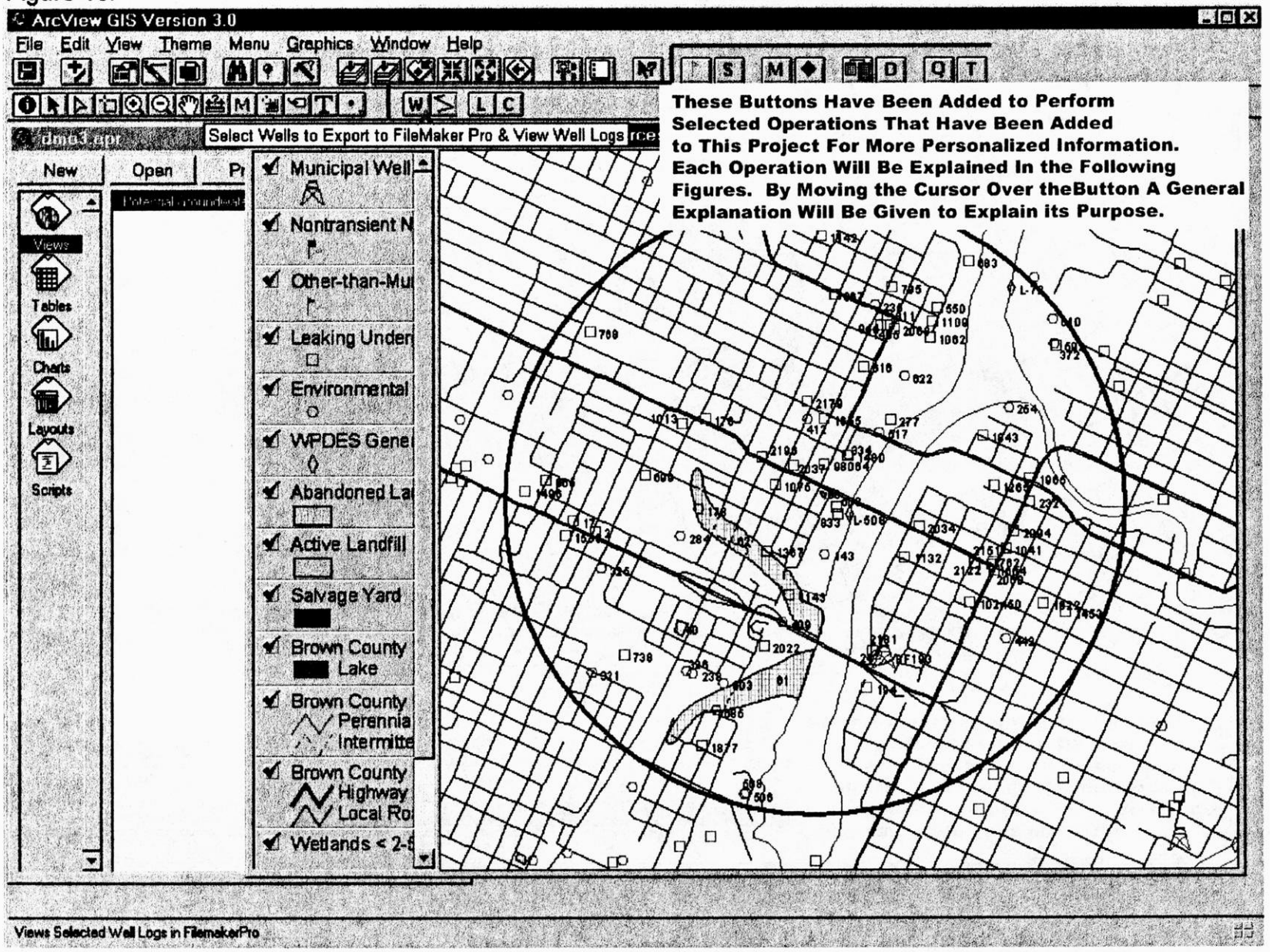

ArcView GIS Version 3.0
File Edit View Theme Menu Graphics Window Help
Select Wells to Export to FileMaker Pro & View Well Logs
New
Open
Views
Tables
Charts
Layouts
Scripts
Municipal Well
Nontransient N
Other-than-Mu
Leaking Under
Environmental
WPDES Gene
Abandoned La
Active Landfill
Salvage Yard
Brown County Lake
Brown County Perennia Intermitte
Brown County Highway Local Ro
Wetlands < 2-5
These Buttons Have Been Added to Perform Selected Operations That Have Been Added to This Project For More Personalized Information. Each Operation Will Be Explained In the Following Figures. By Moving the Cursor Over theButton A General Explanation Will Be Given to Explain its Purpose.
Views Selected Well Logs in FilemakerPro

Figure 11.

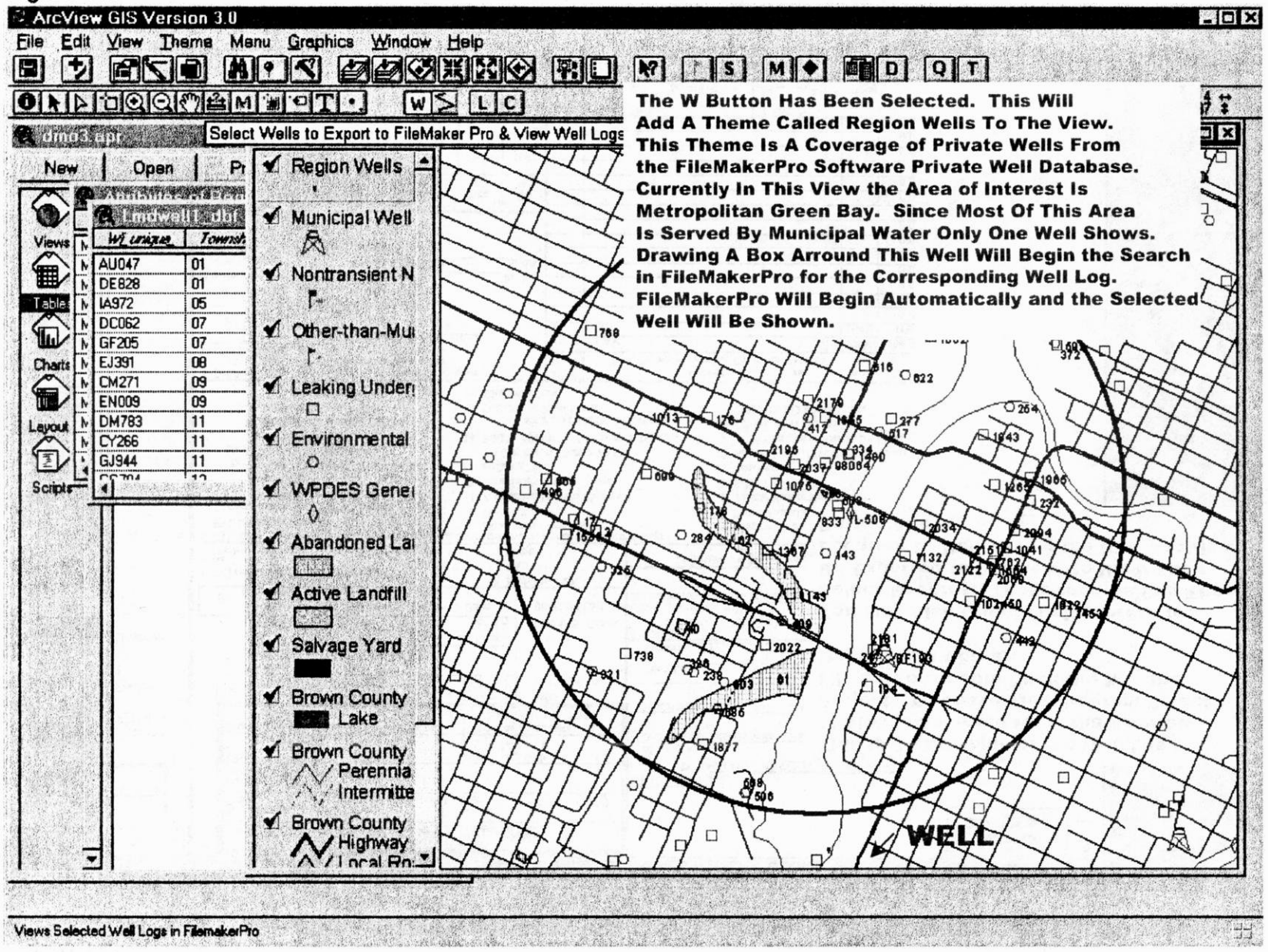

ArcView GIS Version 3.0
File Edit View Thema Manu Graphics Window Help
Select Wells to Export to FileMaker Pro & View Well Logs
New
Open
Views
Table
Charts
Layout
Scripts
Region Wells
Municipal Well
Nontransient N
Other-than-Mu
Leaking Under
Environmental
WPDES Gene
Abandoned La
Active Landfill
Salvage Yard
Brown County Lake
Brown County Perennia Intermitte
Brown County Highway
The W Button Has Been Selected. This Will Add A Theme Called Region Wells To The View. This Theme Is A Coverage of Private Wells From the FileMakerPro Software Private Well Database. Currently In This View the Area of Interest Is Metropolitan Green Bay. Since Most Of This Area Is Served By Municipal Water Only One Well Shows. Drawing A Box Arround This Well Will Begin the Search in FileMakerPro for the Corresponding Well Log. FileMakerPro Will Begin Automatically and the Selected Well Will Be Shown.
WELL
Views Selected Well Logs in FilemakerPro

Figure 12.

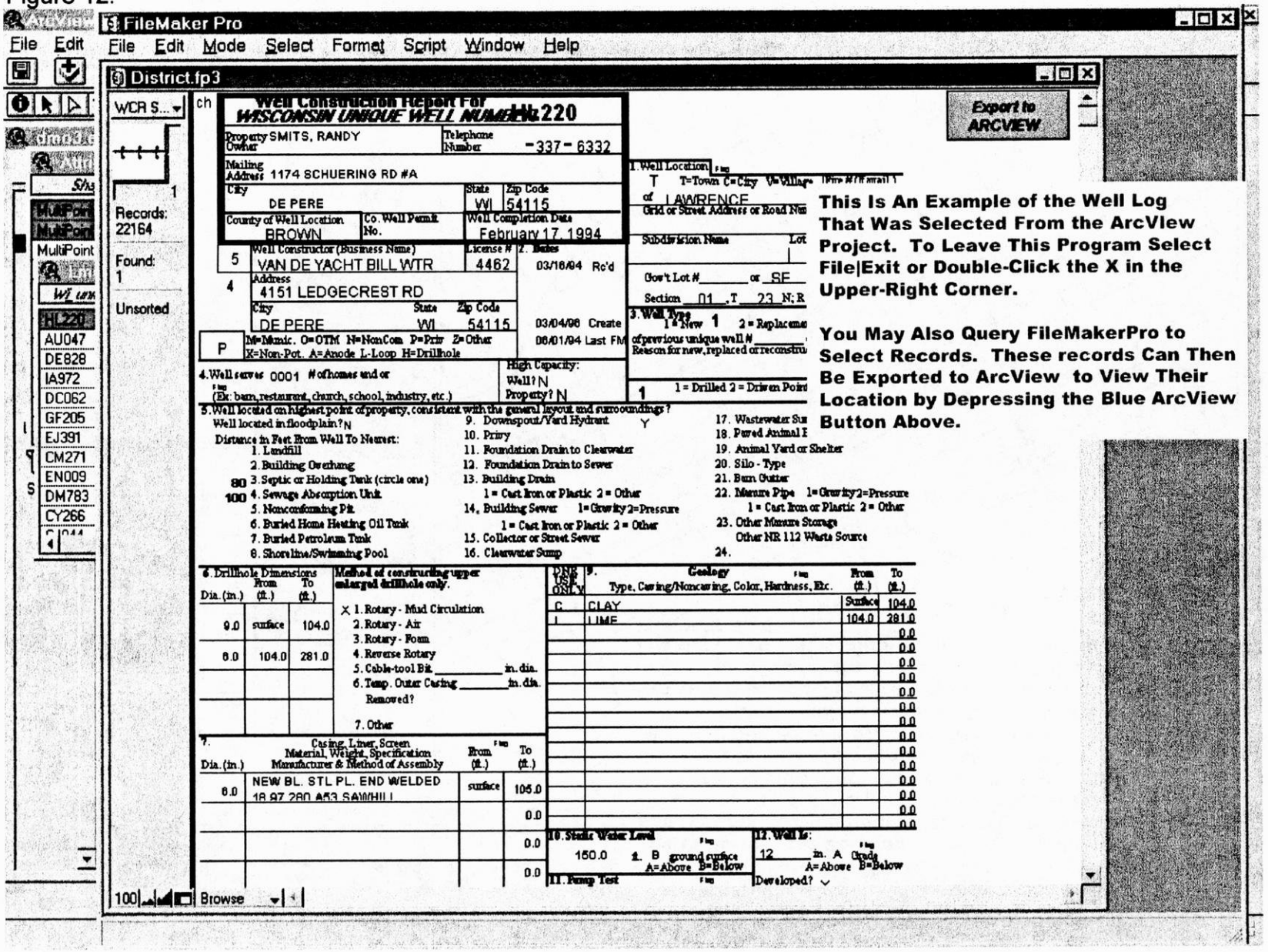

FileMaker Pro
File Edit Mode Select Format Script Window Help
District.fp3
Export to ARCVIEW
Well Construction Report For
WISCONSIN UNIQUE WELL NUMBER HL220
Property Owner SMITS, RANDY
Telephone Number -337- 6332
Mailing Address 1174 SCHUERING RD #A
City DE PERE
State WI
Zip Code 54115
County of Well Location BROWN
Co. Well Permit No.
Well Completion Date February 17, 1994
Well Constructor (Business Name) VAN DE YACHT BILL WTR
License # 4462
03/16/94 Rc'd
Address 4151 LEDGECREST RD
City DE PERE
State WI
Zip Code 54115
03/04/96 Create
06/01/94 Last FM
M=Mimic. O=OTM N=NonCom P=Priv Z=Other
X=Non-Pot. A=Anode L=Loop H=Drillhole
P
1. Well Location
T T=Town C=City V=Village
of LAWRENCE
Grid or Street Address or Road Num
Subdivision Name
Lot
Gov't Lot # or SE
Section 01 ,T 23 N; R
3. Well Type
1 = New 1 2 = Replacem
of previous unique well #
Reason for new, replaced or reconstru
1 = Drilled 2 = Driven Point
4. Well serves 0001 # of homes and or
(Ex: barn, restaurant, church, school, industry, etc.)
High Capacity:
Well? N
Property? N
5. Well located on highest point of property, consistent with the general layout and surroundings?
Well located in floodplain? N
Distance in Feet From Well To Nearest:
1. Landfill
2. Building Overhang
80 3. Septic or Holding Tank (circle one)
100 4. Sewage Absorption Unit
5. Nonconforming Pit
6. Buried Home Heating Oil Tank
7. Buried Petroleum Tank
8. Shoreline/Swimming Pool
9. Downspout/Yard Hydrant Y
10. Privy
11. Foundation Drain to Clearwater
12. Foundation Drain to Sewer
13. Building Drain
1 = Cast Iron or Plastic 2 = Other
14. Building Sewer 1=Gravity 2=Pressure
1 = Cast Iron or Plastic 2 = Other
15. Collector or Street Sewer
16. Clearwater Sump
17. Wastewater Su
18. Paved Animal I
19. Animal Yard or Shelter
20. Silo - Type
21. Barn Gutter
22. Manure Pipe 1=Gravity 2=Pressure
1 = Cast Iron or Plastic 2 = Other
23. Other Manure Storage
Other NR 112 Waste Source
24.
6. Drillhole Dimensions
Dia. (in.) From (ft.) To (ft.)
9.0 surface 104.0
6.0 104.0 281.0
Method of constructing upper enlarged drillhole only.
X 1. Rotary - Mud Circulation
2. Rotary - Air
3. Rotary - Foam
4. Reverse Rotary
5. Cable-tool Bit. in. dia.
6. Temp. Outer Casing in. dia.
Removed?
7. Other
7. Casing, Liner, Screen
Dia. (in.) Material, Weight, Specification Manufacturer & Method of Assembly From (ft.) To (ft.)
6.0 NEW BL. STL PL. END WELDED 18.97 280 A53 SAW/HILL surface 105.0
0.0
0.0
0.0
DNR USE ONLY
9. Geology
Type, Casing/Noncasing, Color, Hardness, Etc.
From (ft.) To (ft.)
C CLAY Surface 104.0
L LIME 104.0 281.0
0.0
10. Static Water Level
150.0 1. B ground surface
A=Above B=Below
11. Pump Test
12. Well is:
12 in. A Grade
A=Above B=Below
Developed?
This Is An Example of the Well Log That Was Selected From the ArcView Project. To Leave This Program Select File|Exit or Double-Click the X in the Upper-Right Corner.
You May Also Query FileMakerPro to Select Records. These records Can Then Be Exported to ArcView to View Their Location by Depressing the Blue ArcView Button Above.
Records: 22164
Found: 1
Unsorted
Browse
HL220
AU047
DE828
IA972
DC062
GF205
EJ391
CM271
EN009
DM783
CY266

Figure 13.

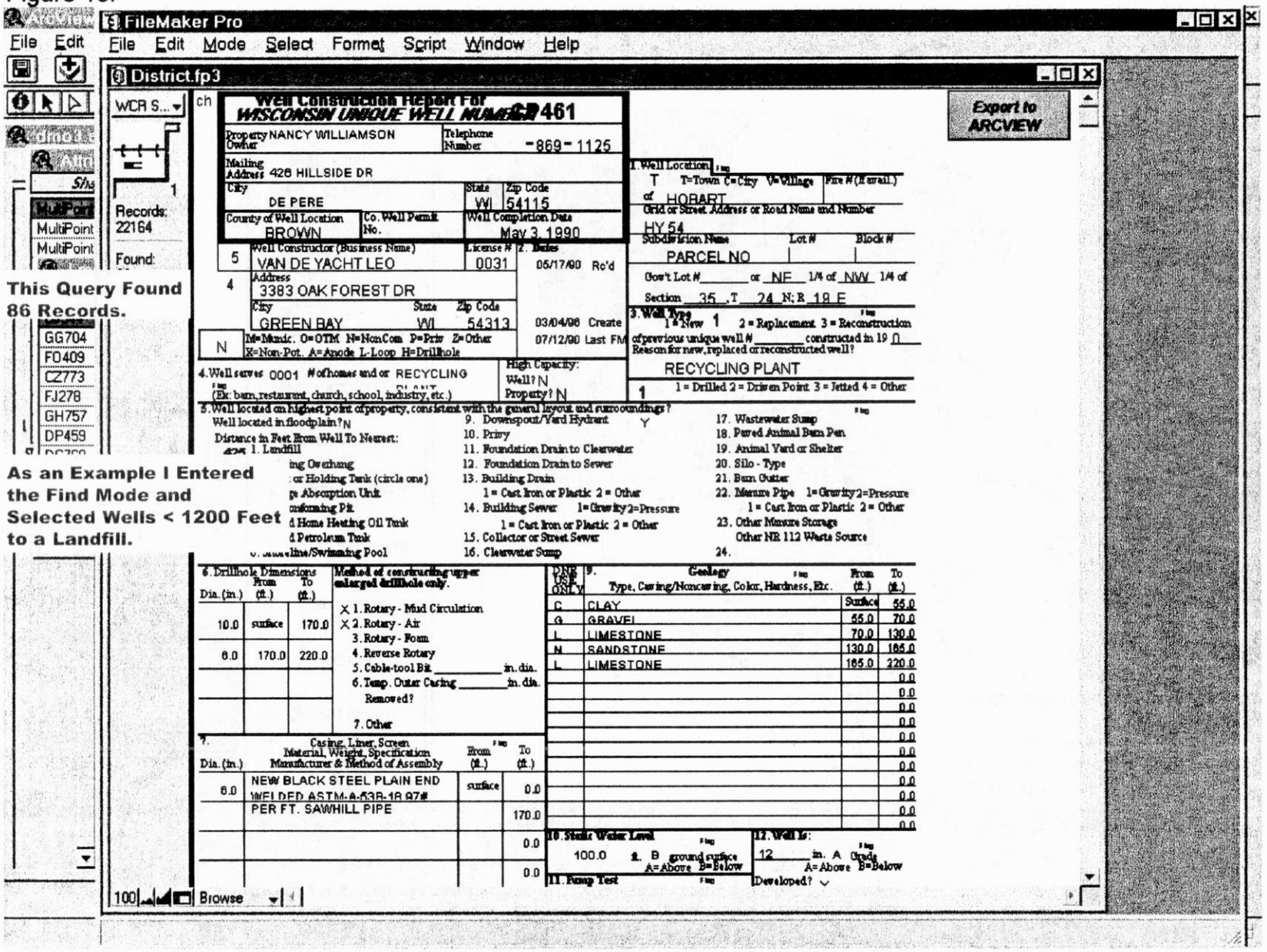

FileMaker Pro
File Edit Mode Select Format Script Window Help
District.fp3
Well Construction Report For
WISCONSIN UNIQUE WELL NUMBER GP 461
Property Owner NANCY WILLIAMSON
Telephone Number -869- 1125
Mailing Address 426 HILLSIDE DR
City DE PERE
State WI
Zip Code 54115
County of Well Location BROWN
Co. Well Permit No.
Well Completion Date May 3, 1990
Well Constructor (Business Name) VAN DE YACHT LEO
License # 0031
Address 3383 OAK FOREST DR
City GREEN BAY
State WI
Zip Code 54313
05/17/90 Rc'd
03/04/96 Create
07/12/90 Last FM
Export to ARCVIEW
1. Well Location
T T=Town C=City V=Village
of HOBART
Grid or Street Address or Road Name and Number HY 54
Subdivision Name PARCEL NO
Lot #
Block #
Gov't Lot # or NE 1/4 of NW 1/4 of
Section 35 , T 24 N; R 19 E
3. Well Type 1 = New 1 2 = Replacement 3 = Reconstruction
of previous unique well #
constructed in 19
Reason for new, replaced or reconstructed well?
RECYCLING PLANT
1 = Drilled 2 = Driven Point 3 = Jetted 4 = Other
4. Well serves 0001 # of homes and or RECYCLING PLANT
(Ex: barn, restaurant, church, school, industry, etc.)
High Capacity: Well? N Property? N
5. Well located on highest point of property, consistent with the general layout and surroundings?
Well located in floodplain? N
Distance in Feet From Well To Nearest:
1. Landfill
ing Overhung
. or Holding Tank (circle one)
ge Absorption Unit
onforming Pit
d Home Heating Oil Tank
d Petroleum Tank
e. Gasoline/Swimming Pool
9. Downspout/Yard Hydrant Y
10. Privy
11. Foundation Drain to Clearwater
12. Foundation Drain to Sewer
13. Building Drain
1 = Cast Iron or Plastic 2 = Other
14. Building Sewer 1=Gravity 2=Pressure
1 = Cast Iron or Plastic 2 = Other
15. Collector or Street Sewer
16. Clearwater Sump
17. Wastewater Sump
18. Paved Animal Barn Pen
19. Animal Yard or Shelter
20. Silo - Type
21. Barn Gutter
22. Manure Pipe 1=Gravity 2=Pressure
1 = Cast Iron or Plastic 2 = Other
23. Other Manure Storage
Other NR 112 Waste Source
24.
6. Drillhole Dimensions
Dia. (in.) From (ft.) To (ft.)
10.0 surface 170.0
6.0 170.0 220.0
Method of constructing upper enlarged drillhole only.
X 1. Rotary - Mud Circulation
X 2. Rotary - Air
3. Rotary - Foam
4. Reverse Rotary
5. Cable-tool Bit in. dia.
6. Temp. Outer Casing in. dia. Removed?
7. Other
7. Casing, Liner, Screen Material, Weight, Specification Manufacturer & Method of Assembly
Dia. (in.) From (ft.) To (ft.)
6.0 NEW BLACK STEEL PLAIN END WELDED ASTM-A-53B-1B 97# PER FT. SAWHILL PIPE surface 0.0
170.0
0.0
0.0
DNR USE ONLY
9. Geology Type, Casing/Noncasing, Color, Hardness, Etc.
From (ft.) To (ft.)
C CLAY Surface 55.0
G GRAVEL 55.0 70.0
L LIMESTONE 70.0 130.0
N SANDSTONE 130.0 165.0
L LIMESTONE 165.0 220.0
10. Static Water Level
100.0 ft. B ground surface A=Above B=Below
11. Pump Test
12. Well is:
12 in. A Grade A=Above B=Below
Developed?
Records: 22164
Found:
This Query Found 86 Records.
GG704
FO409
CZ773
FJ278
GH757
DP459
As an Example I Entered the Find Mode and Selected Wells < 1200 Feet to a Landfill.
100
Browse

Figure 14.

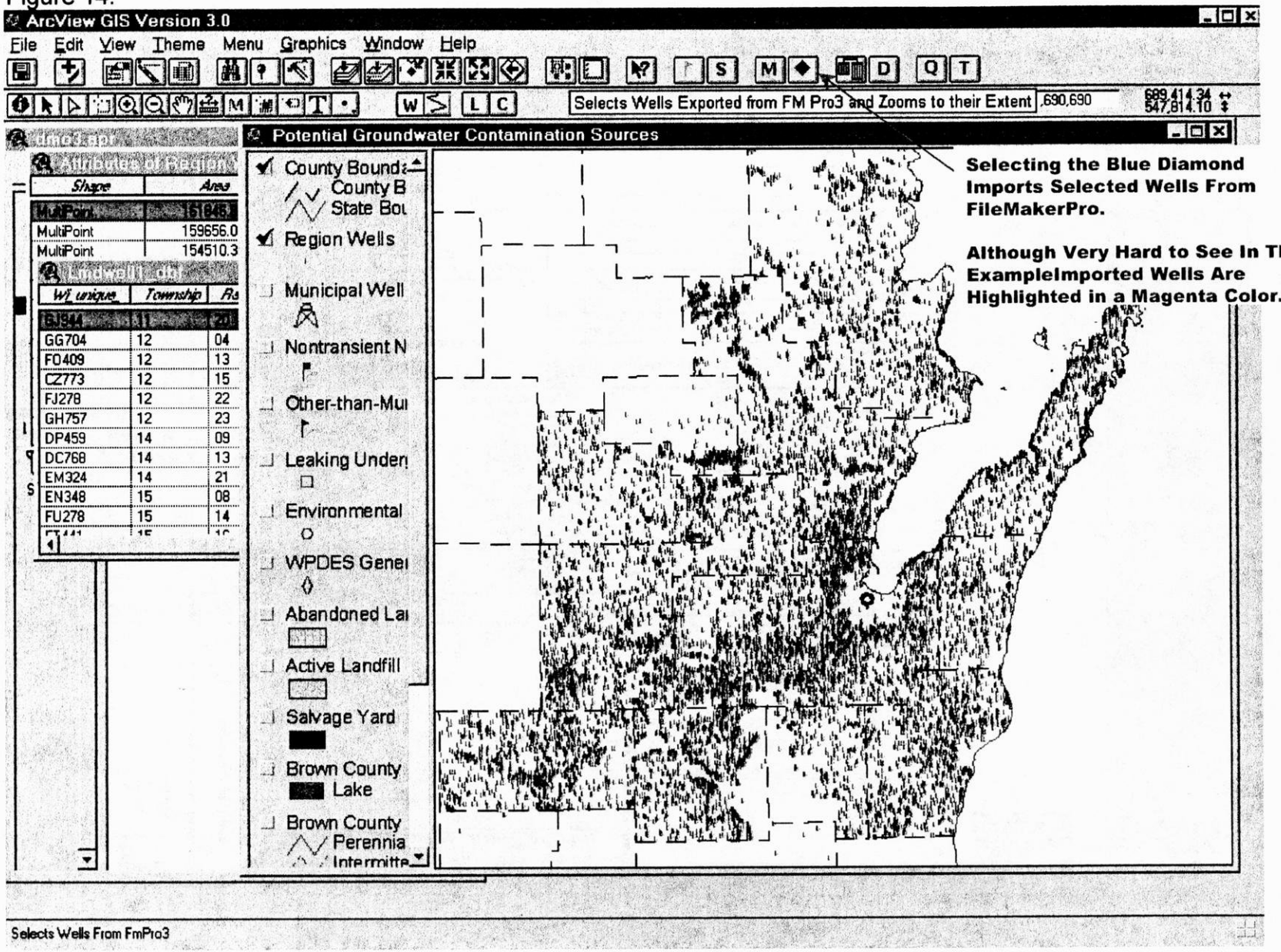

ArcView GIS Version 3.0
File Edit View Theme Menu Graphics Window Help
Selects Wells Exported from FM Pro3 and Zooms to their Extent
Potential Groundwater Contamination Sources
Attributes of Region
Shape
Area
MultiPoint
MultiPoint 159656.0
MultiPoint 154510.3
Township
GG704 12 04
FO409 12 13
CZ773 12 15
FJ278 12 22
GH757 12 23
DP459 14 09
DC768 14 13
EM324 14 21
EN348 15 08
FU278 15 14
County Boundz
County B
State Bou
Region Wells
Municipal Well
Nontransient N
Other-than-Mul
Leaking Under
Environmental
WPDES Gener
Abandoned Lai
Active Landfill
Salvage Yard
Brown County
Lake
Brown County
Perennia
Intermitte
Selecting the Blue Diamond Imports Selected Wells From FileMakerPro.
Although Very Hard to See In This ExampleImported Wells Are Highlighted in a Magenta Color.
Selects Wells From FmPro3

Figure 15.

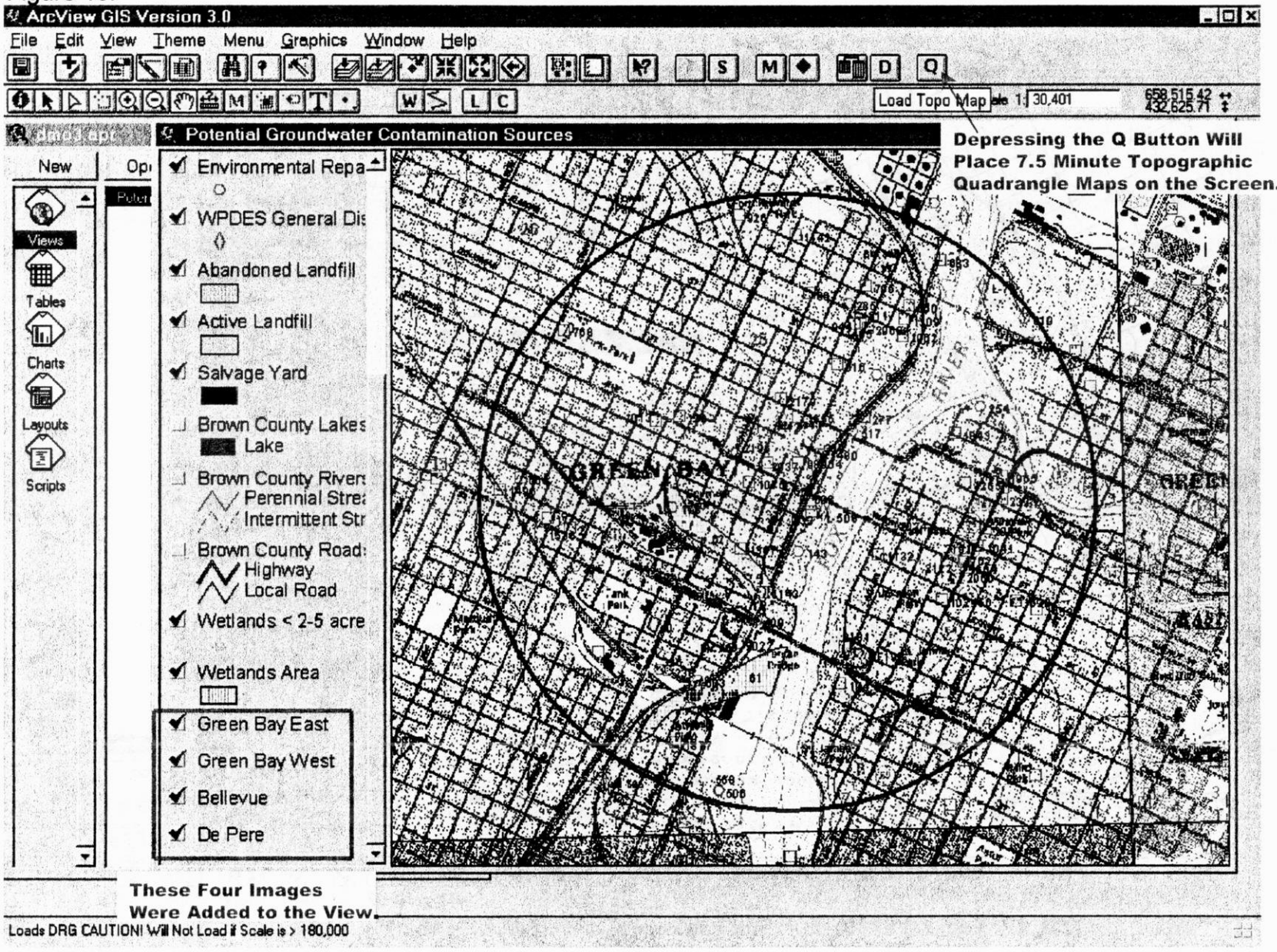

ArcView GIS Version 3.0
File Edit View Theme Menu Graphics Window Help
Load Topo Map
Potential Groundwater Contamination Sources
Depressing the Q Button Will Place 7.5 Minute Topographic Quadrangle Maps on the Screen.
New
Views
Tables
Charts
Layouts
Scripts
Environmental Repa
WPDES General Dis
Abandoned Landfill
Active Landfill
Salvage Yard
Brown County Lakes
Lake
Brown County River
Perennial Strea
Intermittent Str
Brown County Road
Highway
Local Road
Wetlands < 2-5 acre
Wetlands Area
Green Bay East
Green Bay West
Bellevue
De Pere
These Four Images Were Added to the View.
Loads DRG CAUTION! Will Not Load if Scale is > 180,000

Figure 16.

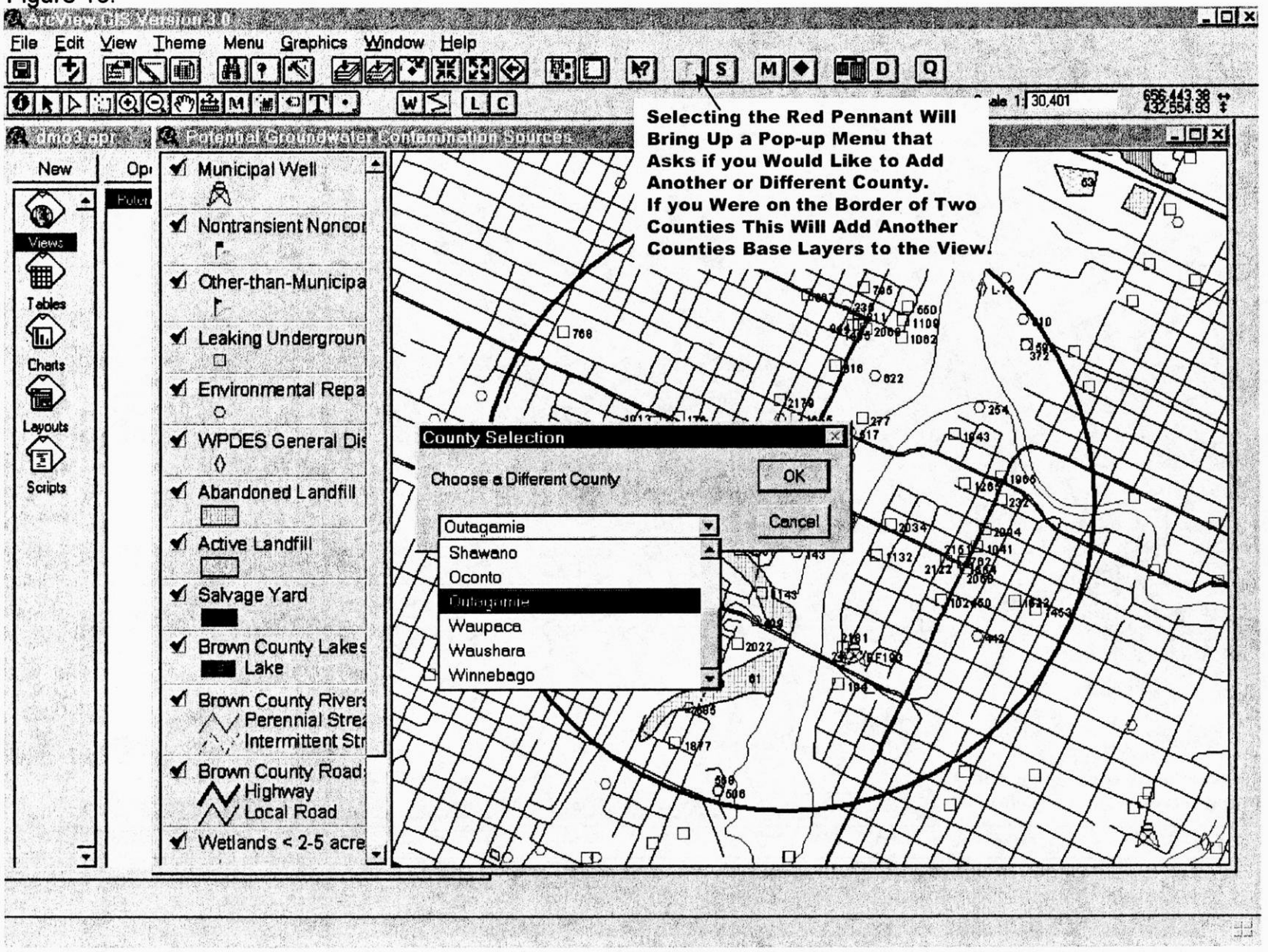

ArcView GIS Version 3.0
File Edit View Theme Menu Graphics Window Help
Potential Groundwater Contamination Sources
New
Views
Tables
Charts
Layouts
Scripts
Municipal Well
Nontransient Noncor
Other-than-Municipa
Leaking Undergroun
Environmental Repa
WPDES General Dis
Abandoned Landfill
Active Landfill
Salvage Yard
Brown County Lakes
Lake
Brown County Rivers
Perennial Strea
Intermittent Str
Brown County Roads
Highway
Local Road
Wetlands < 2-5 acre
Selecting the Red Pennant Will Bring Up a Pop-up Menu that Asks if you Would Like to Add Another or Different County. If you Were on the Border of Two Counties This Will Add Another Counties Base Layers to the View.
County Selection
Choose a Different County
OK
Cancel
Outagamie
Shawano
Oconto
Outagamie
Waupaca
Waushara
Winnebago

Figure 17.

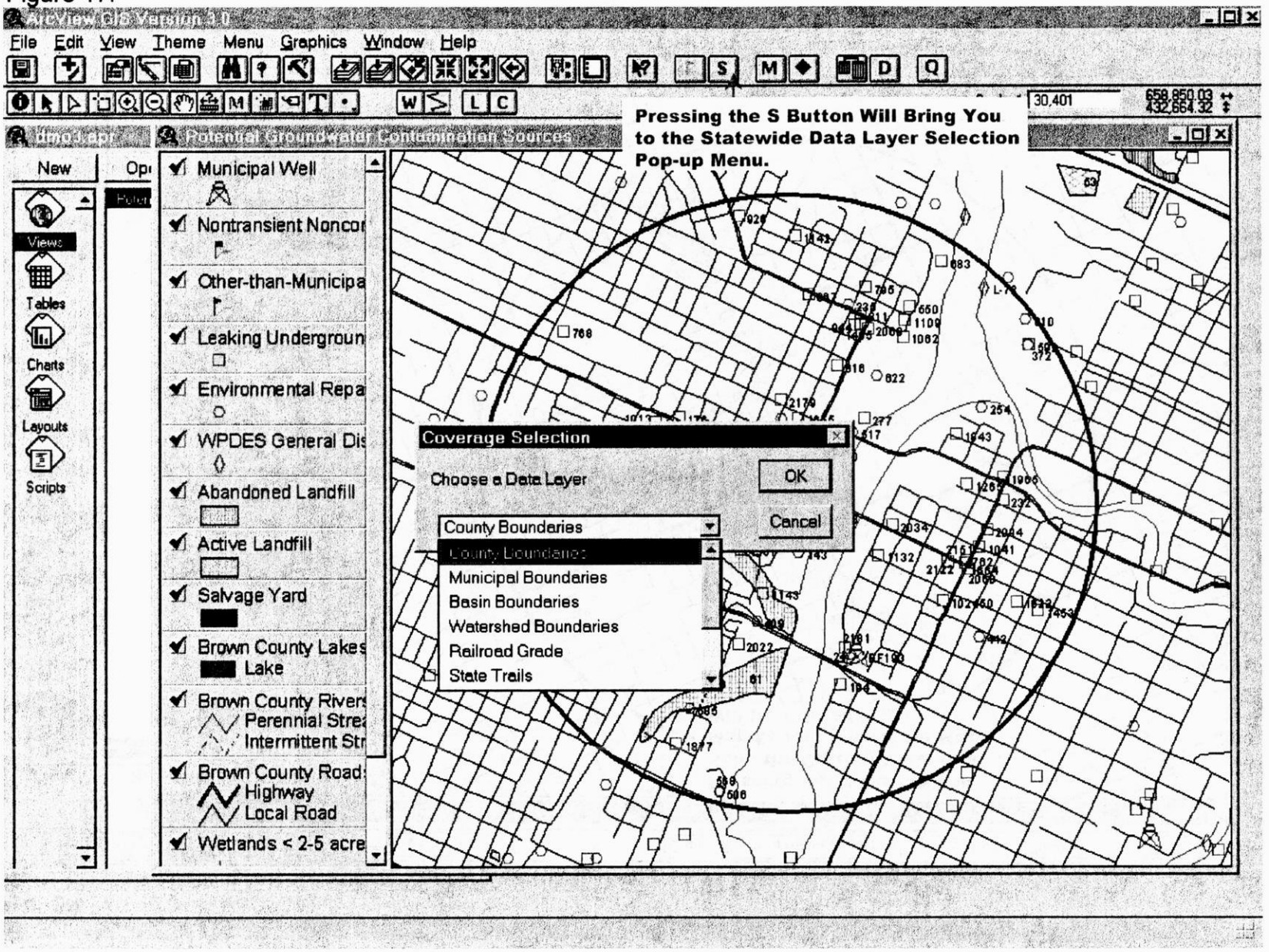

File Edit View Theme Menu Graphics Window Help
Pressing the S Button Will Bring You to the Statewide Data Layer Selection Pop-up Menu.
Potential Groundwater Contamination Sources
New
Views
Tables
Charts
Layouts
Scripts
Municipal Well
Nontransient Noncor
Other-than-Municipa
Leaking Undergroun
Environmental Repa
WPDES General Dis
Abandoned Landfill
Active Landfill
Salvage Yard
Brown County Lakes
Lake
Brown County River
Perennial Strea
Intermittent Str
Brown County Road
Highway
Local Road
Wetlands < 2-5 acre
Coverage Selection
Choose a Data Layer
OK
Cancel
County Boundaries
County Boundaries
Municipal Boundaries
Basin Boundaries
Watershed Boundaries
Railroad Grade
State Trails

Figure 18.

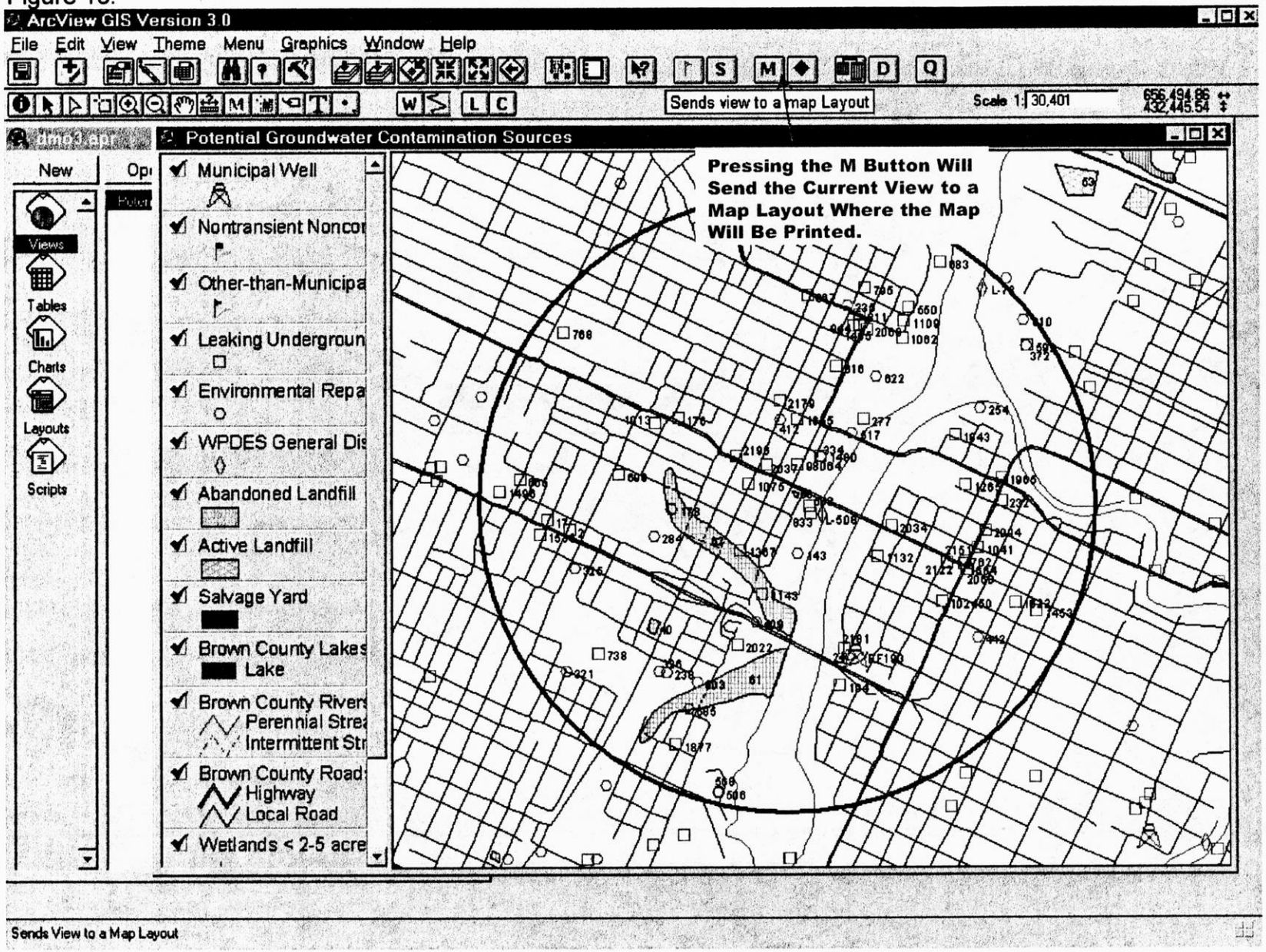

ArcView GIS Version 3.0
File Edit View Theme Menu Graphics Window Help
Sends view to a map Layout
Scale 1: 30,401
656,494.86
432,445.54
dmo3.apr
Potential Groundwater Contamination Sources
New
Views
Tables
Charts
Layouts
Scripts
Municipal Well
Nontransient Noncor
Other-than-Municipa
Leaking Undergroun
Environmental Repa
WPDES General Dis
Abandoned Landfill
Active Landfill
Salvage Yard
Brown County Lakes
Lake
Brown County River
Perennial Strea
Intermittent Str
Brown County Road
Highway
Local Road
Wetlands < 2-5 acre
Pressing the M Button Will Send the Current View to a Map Layout Where the Map Will Be Printed.
Sends View to a Map Layout

Figure 19.

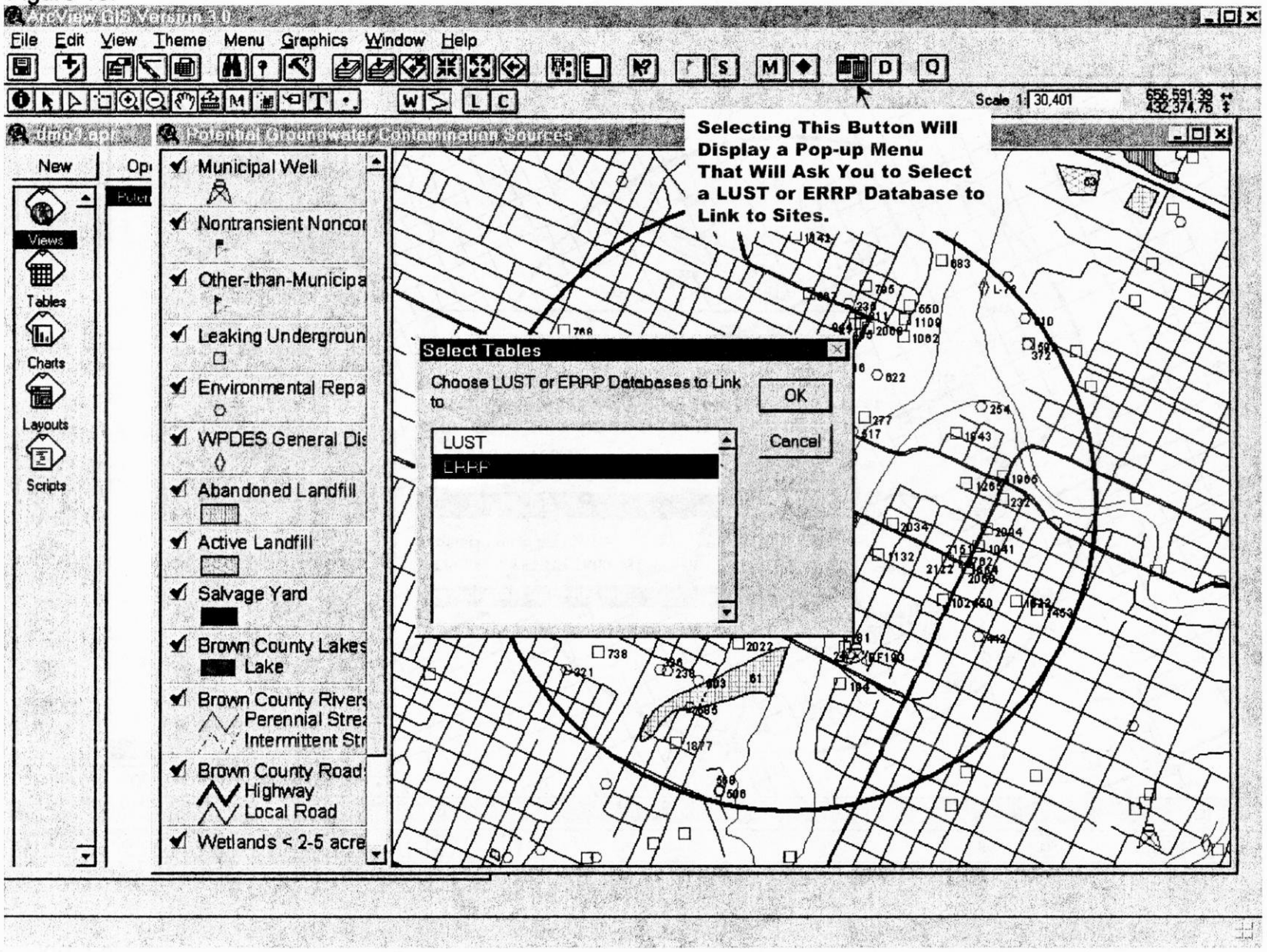

File Edit View Theme Menu Graphics Window Help
Scale 1: 30,401
Selecting This Button Will Display a Pop-up Menu That Will Ask You to Select a LUST or ERRP Database to Link to Sites.
Potential Groundwater Contamination Sources
New
Views
Tables
Charts
Layouts
Scripts
Municipal Well
Nontransient Noncor
Other-than-Municipa
Leaking Undergroun
Environmental Repa
WPDES General Dis
Abandoned Landfill
Active Landfill
Salvage Yard
Brown County Lakes
Lake
Brown County River
Perennial Strea
Intermittent Str
Brown County Road
Highway
Local Road
Wetlands < 2-5 acre
Select Tables
Choose LUST or ERRP Databases to Link to
OK
Cancel
LUST
ERRP

Figure 20.

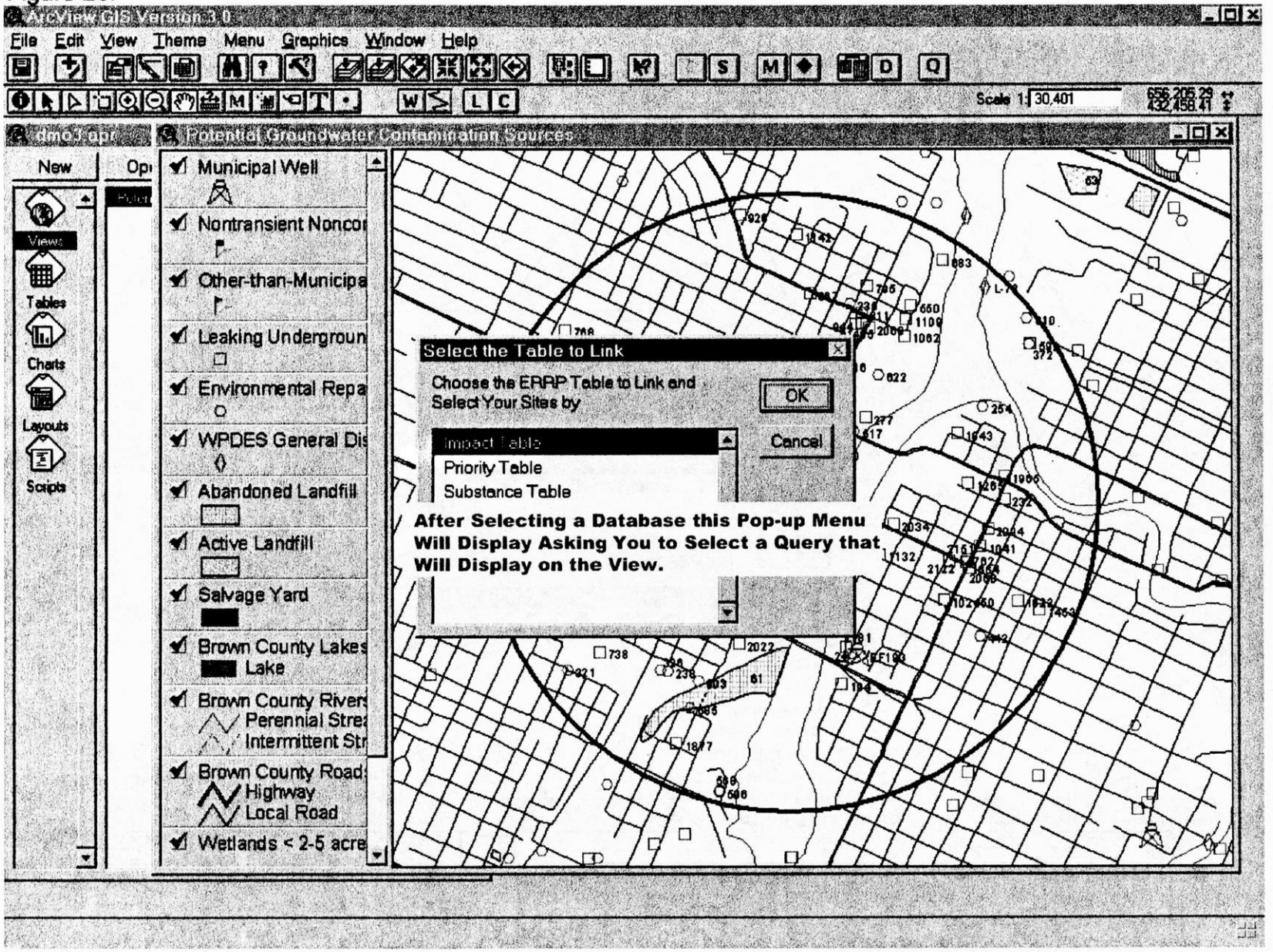

ArcView GIS Version 3.0
File Edit View Theme Menu Graphics Window Help
Scale 1: 30,401
dmo1.apr
Potential Groundwater Contamination Sources
New
Views
Tables
Charts
Layouts
Scripts
Municipal Well
Nontransient Noncor
Other-than-Municipa
Leaking Undergroun
Environmental Repa
WPDES General Dis
Abandoned Landfill
Active Landfill
Salvage Yard
Brown County Lakes
Lake
Brown County River
Perennial Strea
Intermittent Str
Brown County Road
Highway
Local Road
Wetlands < 2-5 acre
Select the Table to Link
Choose the ERRP Table to Link and Select Your Sites by
OK
Cancel
Impact Table
Priority Table
Substance Table
After Selecting a Database this Pop-up Menu Will Display Asking You to Select a Query that Will Display on the View.

Figure 21.

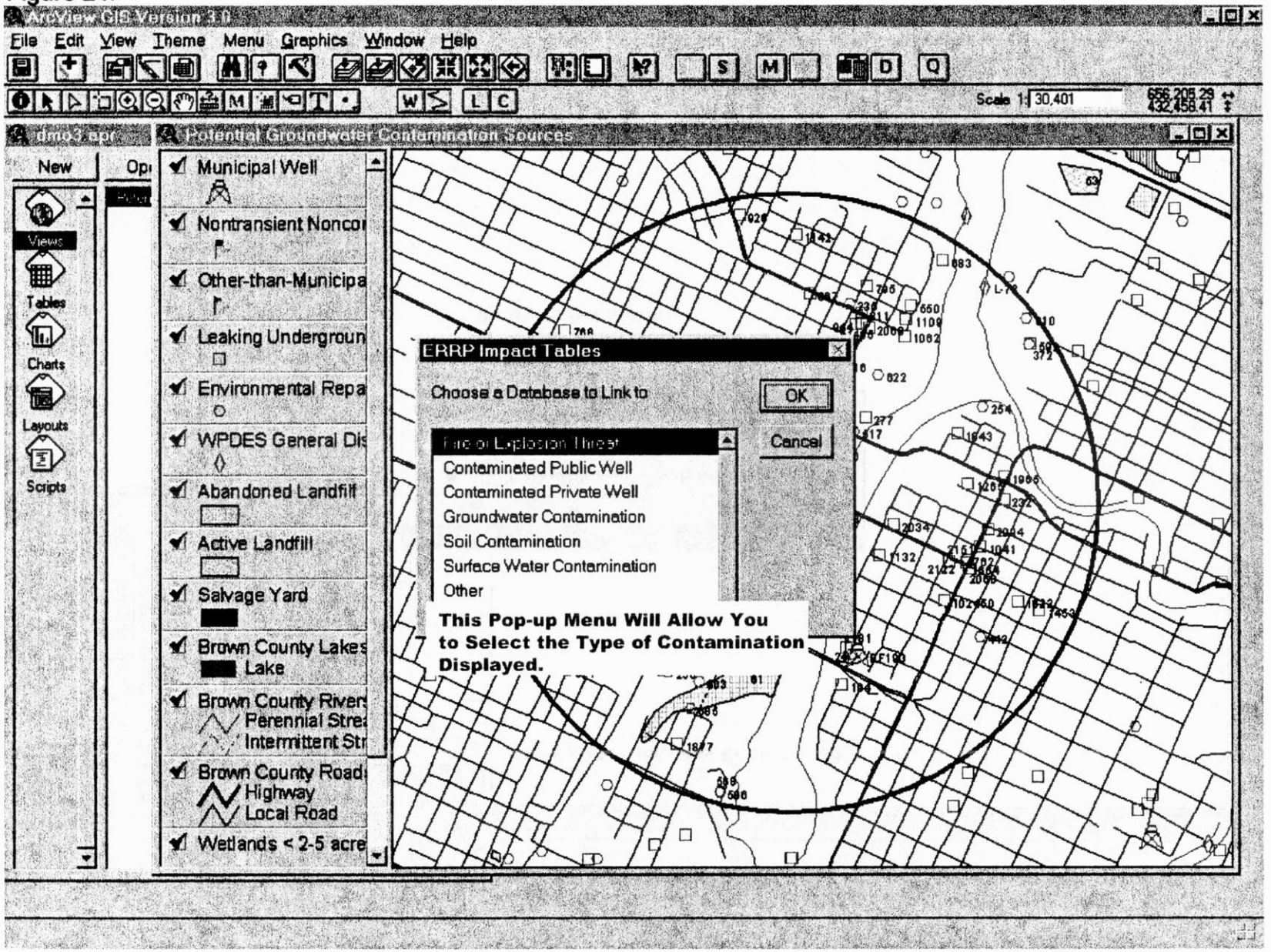

ArcView GIS Version 3.0
File Edit View Theme Menu Graphics Window Help
Scale 1: 30,401
dmo3.apr
Potential Groundwater Contamination Sources
New
Views
Tables
Charts
Layouts
Scripts
Municipal Well
Nontransient Noncor
Other-than-Municipa
Leaking Undergroun
Environmental Repa
WPDES General Dis
Abandoned Landfill
Active Landfill
Salvage Yard
Brown County Lakes
Lake
Brown County River
Perennial Strea
Intermittent Str
Brown County Road
Highway
Local Road
Wetlands < 2-5 acre
ERRP Impact Tables
Choose a Database to Link to
OK
Cancel
Fire or Explosion Threat
Contaminated Public Well
Contaminated Private Well
Groundwater Contamination
Soil Contamination
Surface Water Contamination
Other
This Pop-up Menu Will Allow You to Select the Type of Contamination Displayed.

Figure 22.

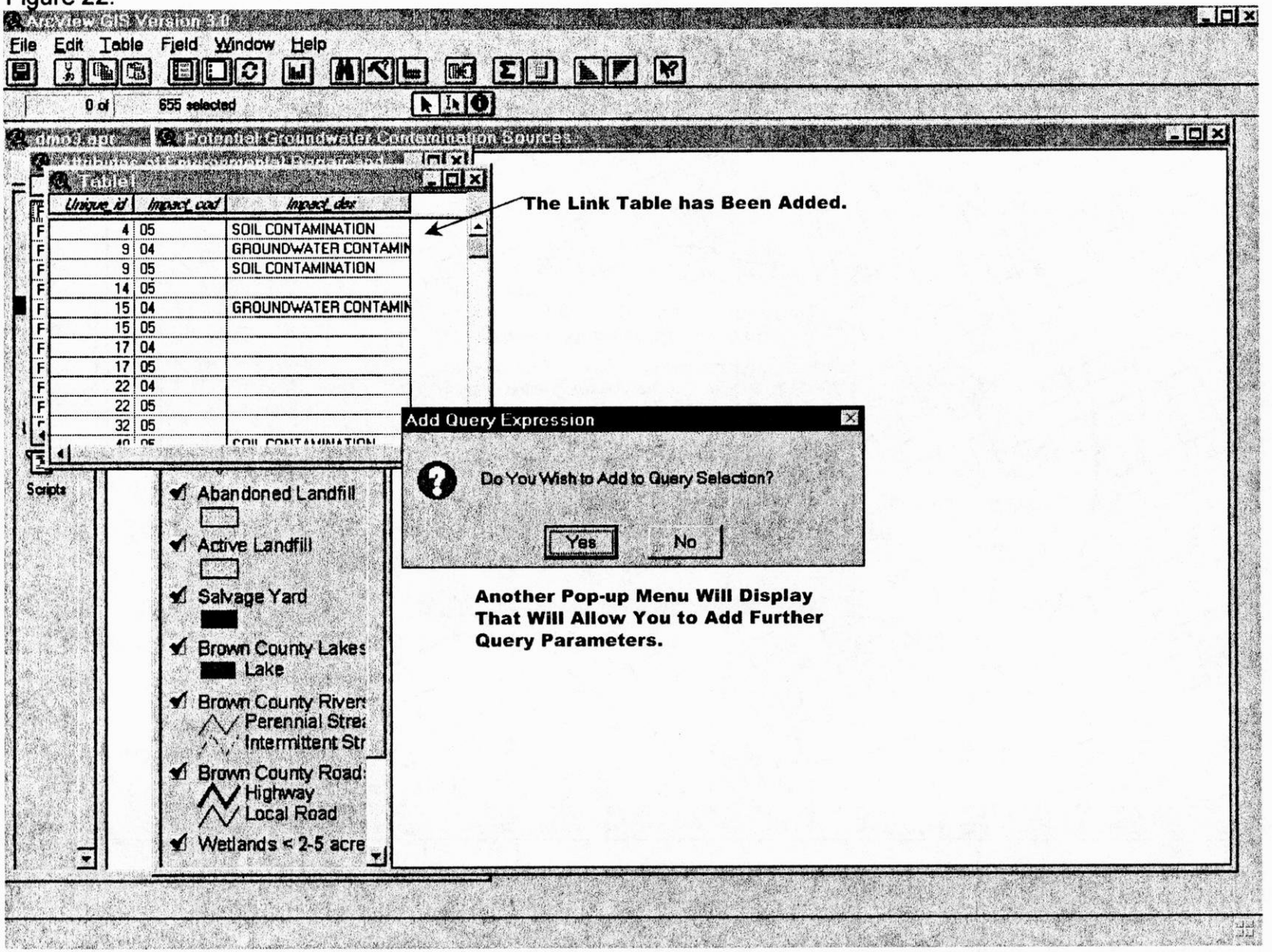

File Edit Table Field Window Help
0 of 655 selected
Potential Groundwater Contamination Sources
Table1
Unique_id
Impact_cod
Impact_des
4 05 SOIL CONTAMINATION
9 04 GROUNDWATER CONTAMIN
9 05 SOIL CONTAMINATION
14 05
15 04 GROUNDWATER CONTAMIN
15 05
17 04
17 05
22 04
22 05
32 05
The Link Table has Been Added.
Add Query Expression
Do You Wish to Add to Query Selection?
Yes
No
Another Pop-up Menu Will Display That Will Allow You to Add Further Query Parameters.
Scripts
Abandoned Landfill
Active Landfill
Salvage Yard
Brown County Lakes
Lake
Brown County Rivers
Perennial Strea
Intermittent Str
Brown County Roads
Highway
Local Road
Wetlands < 2-5 acre

Figure 23.

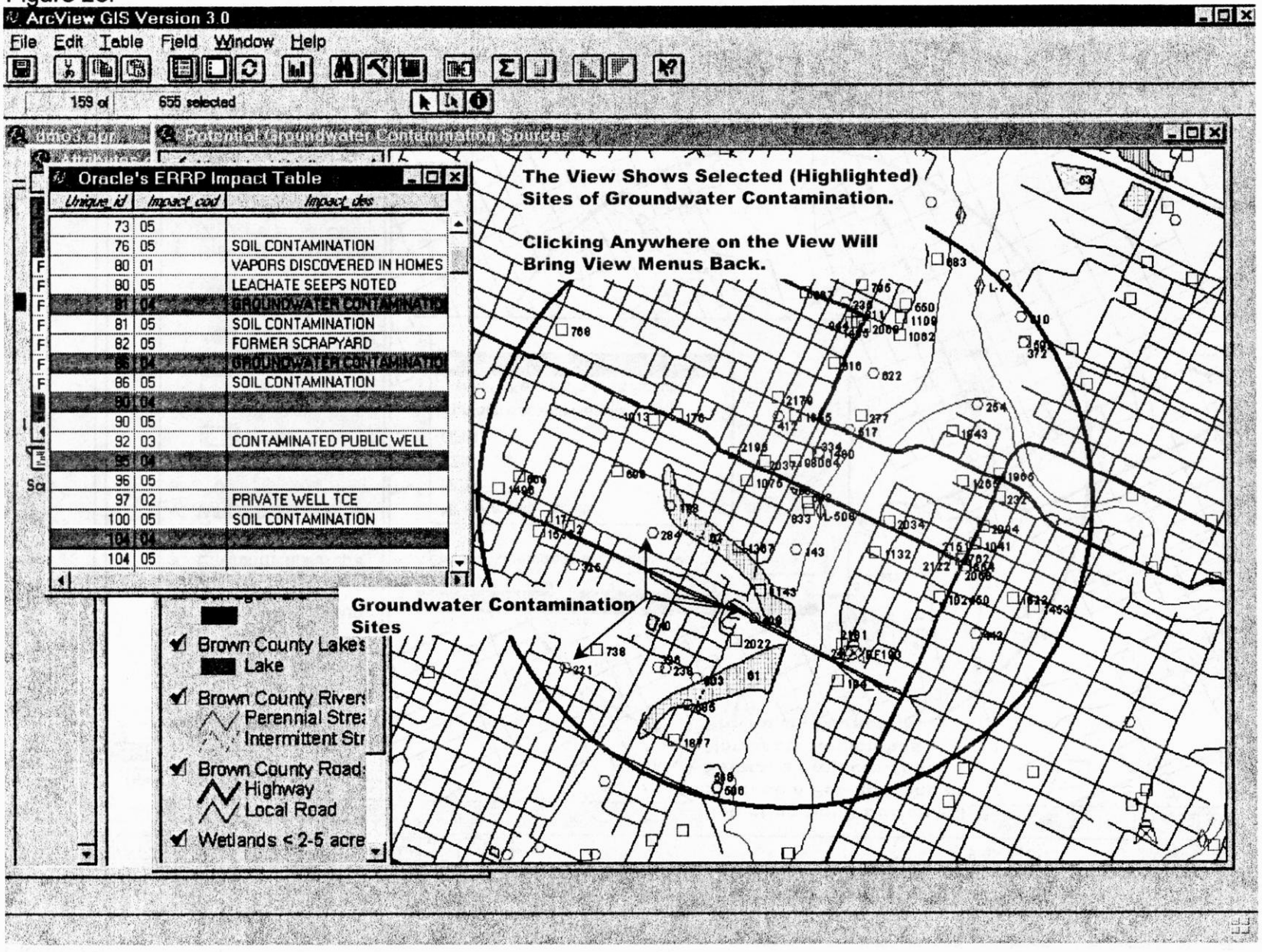

ArcView GIS Version 3.0
File Edit Table Field Window Help
159 of 655 selected
Potential Groundwater Contamination Sources
Oracle's ERRP Impact Table
Unique_id | Impact_cod | Impact_des
73 | 05 |
76 | 05 | SOIL CONTAMINATION
80 | 01 | VAPORS DISCOVERED IN HOMES
80 | 05 | LEACHATE SEEPS NOTED
81 | 04 | GROUNDWATER CONTAMINATION
81 | 05 | SOIL CONTAMINATION
82 | 05 | FORMER SCRAPYARD
86 | 04 | GROUNDWATER CONTAMINATION
86 | 05 | SOIL CONTAMINATION
90 | 04 |
90 | 05 |
92 | 03 | CONTAMINATED PUBLIC WELL
96 | 04 |
96 | 05 |
97 | 02 | PRIVATE WELL TCE
100 | 05 | SOIL CONTAMINATION
104 | 04 |
104 | 05 |
The View Shows Selected (Highlighted) Sites of Groundwater Contamination.
Clicking Anywhere on the View Will Bring View Menus Back.
Groundwater Contamination Sites
Brown County Lakes
Lake
Brown County Rivers
Perennial Stre
Intermittent Str
Brown County Roads
Highway
Local Road
Wetlands < 2-5 acre

Figure 24.

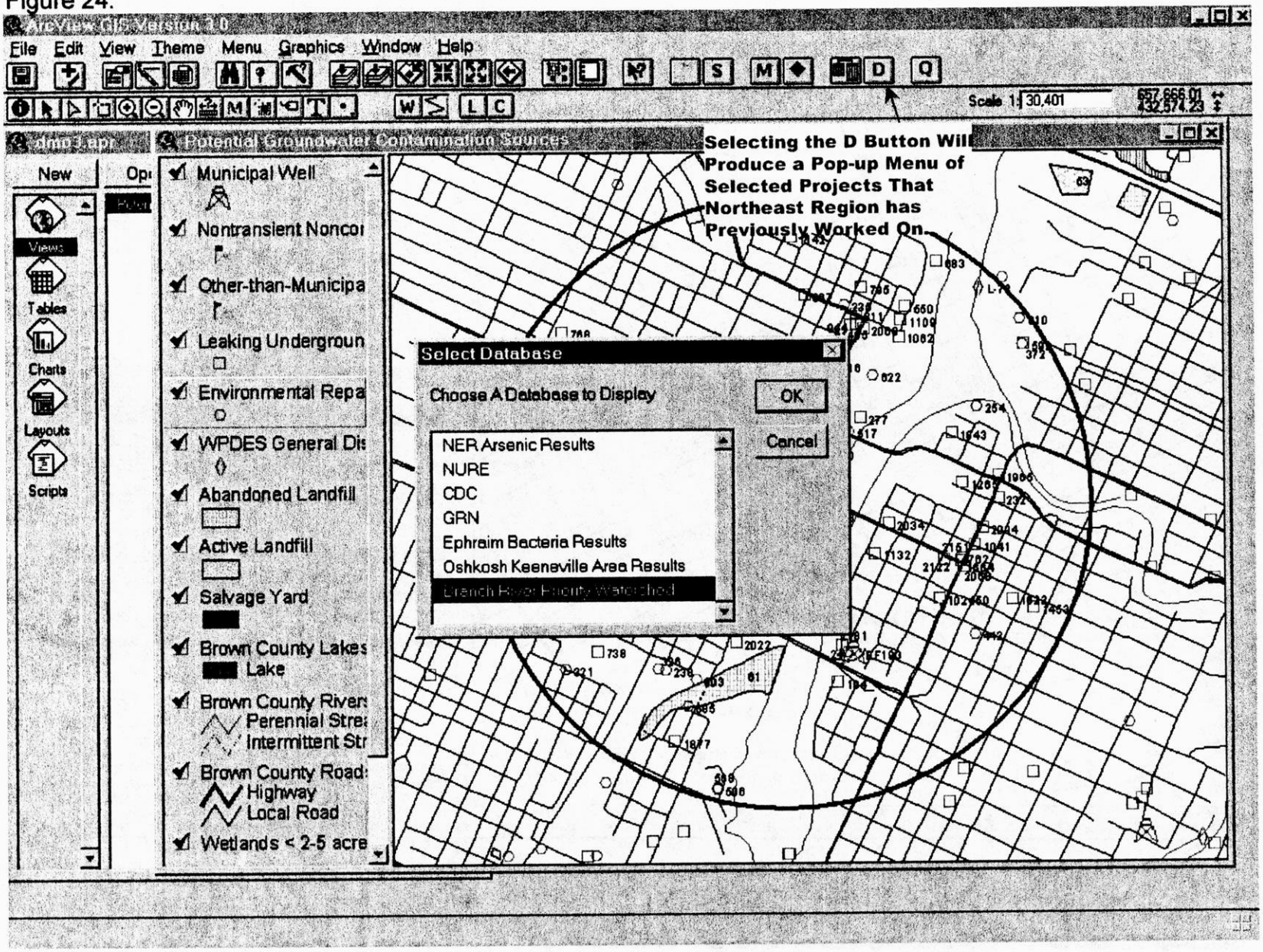

File Edit View Theme Menu Graphics Window Help
Scale 1: 30,401
Potential Groundwater Contamination Sources
Selecting the D Button Will Produce a Pop-up Menu of Selected Projects That Northeast Region has Previously Worked On.
New
Views
Tables
Charts
Layouts
Scripts
Municipal Well
Nontransient Noncor
Other-than-Municipa
Leaking Undergroun
Environmental Repa
WPDES General Dis
Abandoned Landfill
Active Landfill
Salvage Yard
Brown County Lakes
Lake
Brown County River
Perennial Strea
Intermittent Str
Brown County Road
Highway
Local Road
Wetlands < 2-5 acre
Select Database
Choose A Database to Display
OK
Cancel
NER Arsenic Results
NURE
CDC
GRN
Ephraim Bacteria Results
Oshkosh Keeneville Area Results

Figure 25.

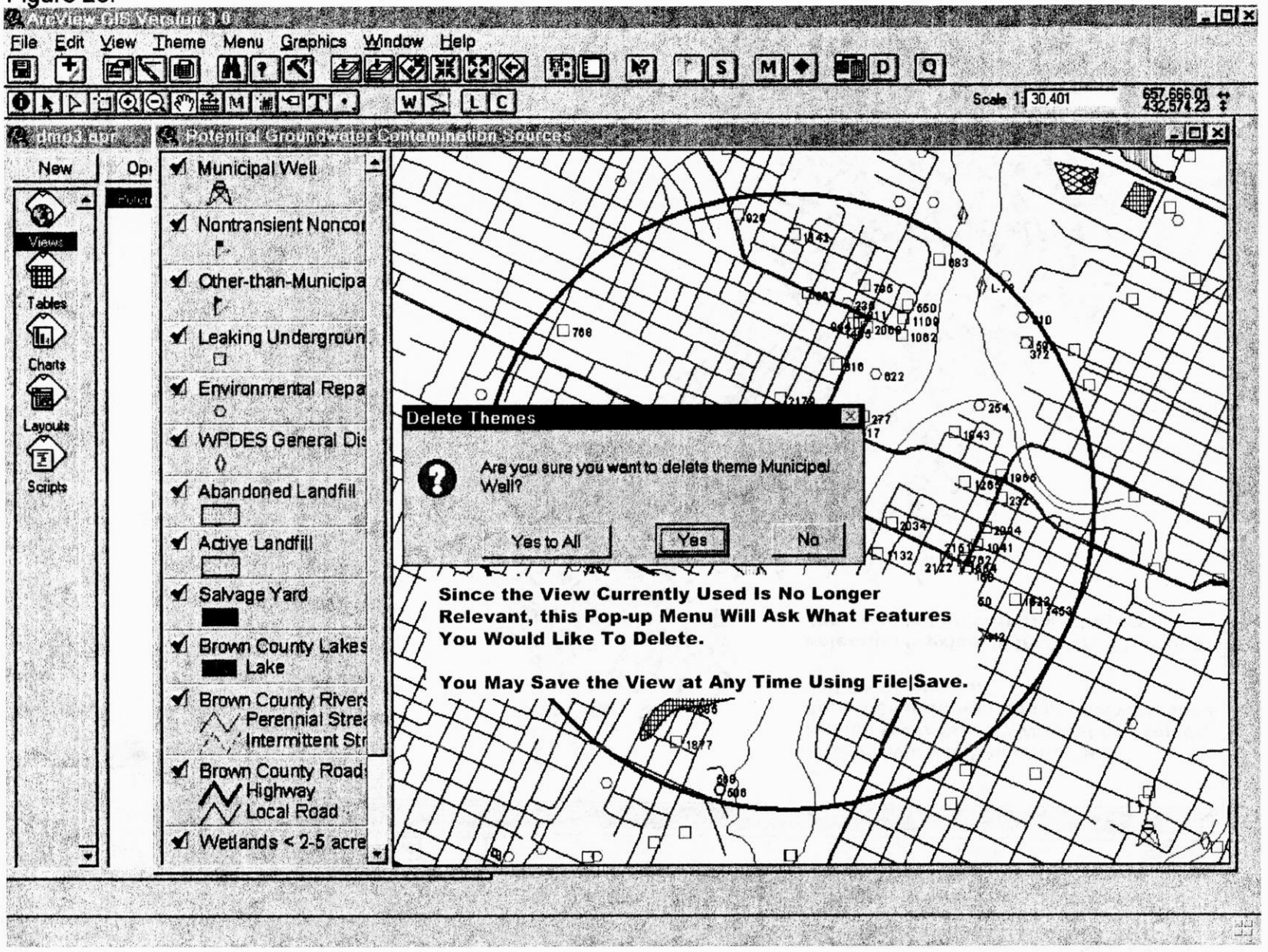

File Edit View Theme Menu Graphics Window Help
Scale 1: 30,401
New
Views
Tables
Charts
Layouts
Scripts
Municipal Well
Nontransient Noncor
Other-than-Municipa
Leaking Undergroun
Environmental Repa
WPDES General Dis
Abandoned Landfill
Active Landfill
Salvage Yard
Brown County Lakes
Lake
Brown County River
Perennial Stre
Intermittent Str
Brown County Road
Highway
Local Road
Wetlands < 2-5 acre
Potential Groundwater Contamination Sources
Delete Themes
Are you sure you want to delete theme Municipal Well?
Yes to All
Yes
No
Since the View Currently Used Is No Longer Relevant, this Pop-up Menu Will Ask What Features You Would Like To Delete.
You May Save the View at Any Time Using File|Save.

Figure 26.

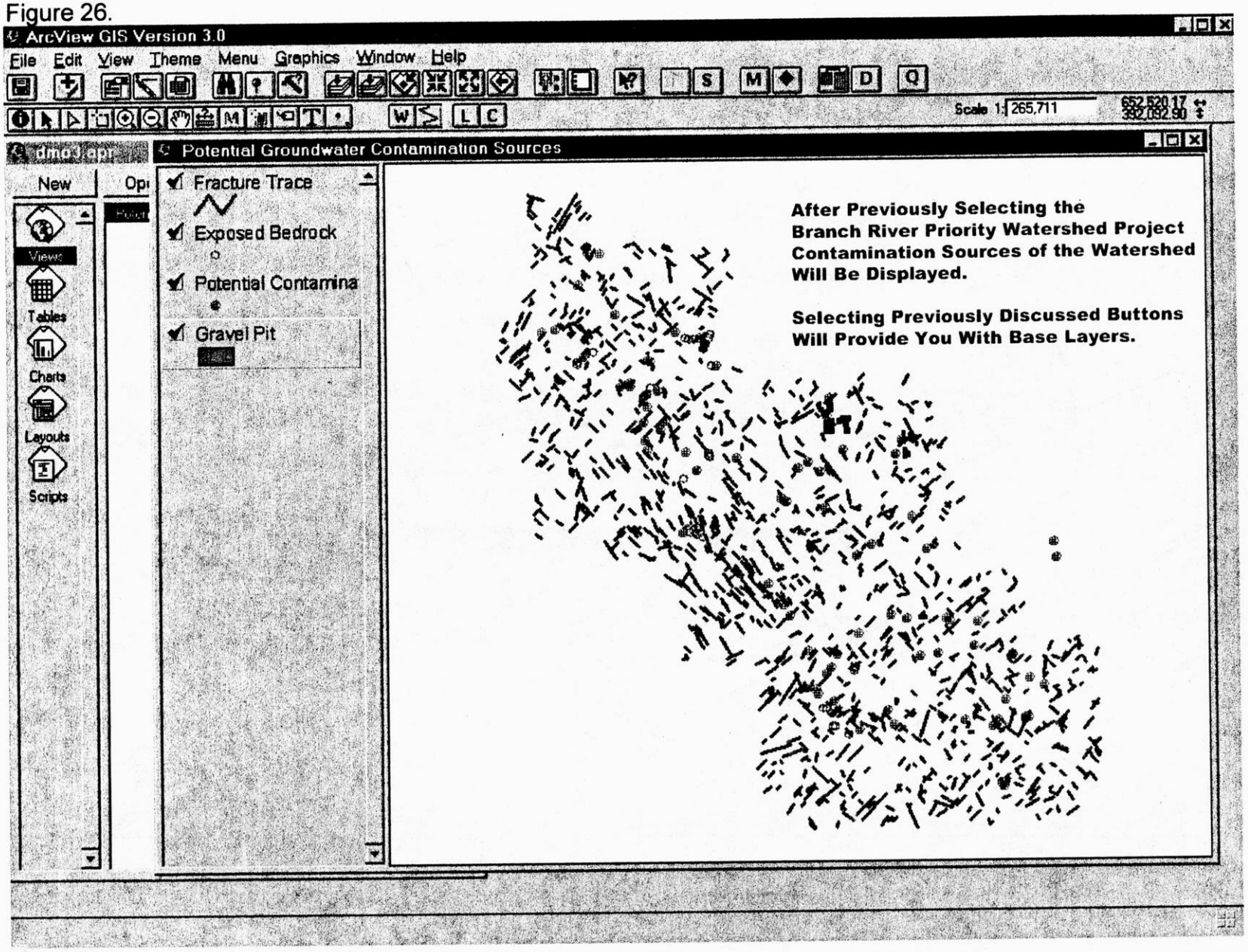

ArcView GIS Version 3.0
File Edit View Theme Menu Graphics Window Help
Scale 1: 265,711
Potential Groundwater Contamination Sources
New
Views
Tables
Charts
Layouts
Scripts
Fracture Trace
Exposed Bedrock
Potential Contamina
Gravel Pit
After Previously Selecting the
Branch River Priority Watershed Project
Contamination Sources of the Watershed
Will Be Displayed.
Selecting Previously Discussed Buttons
Will Provide You With Base Layers.

Figure 27.

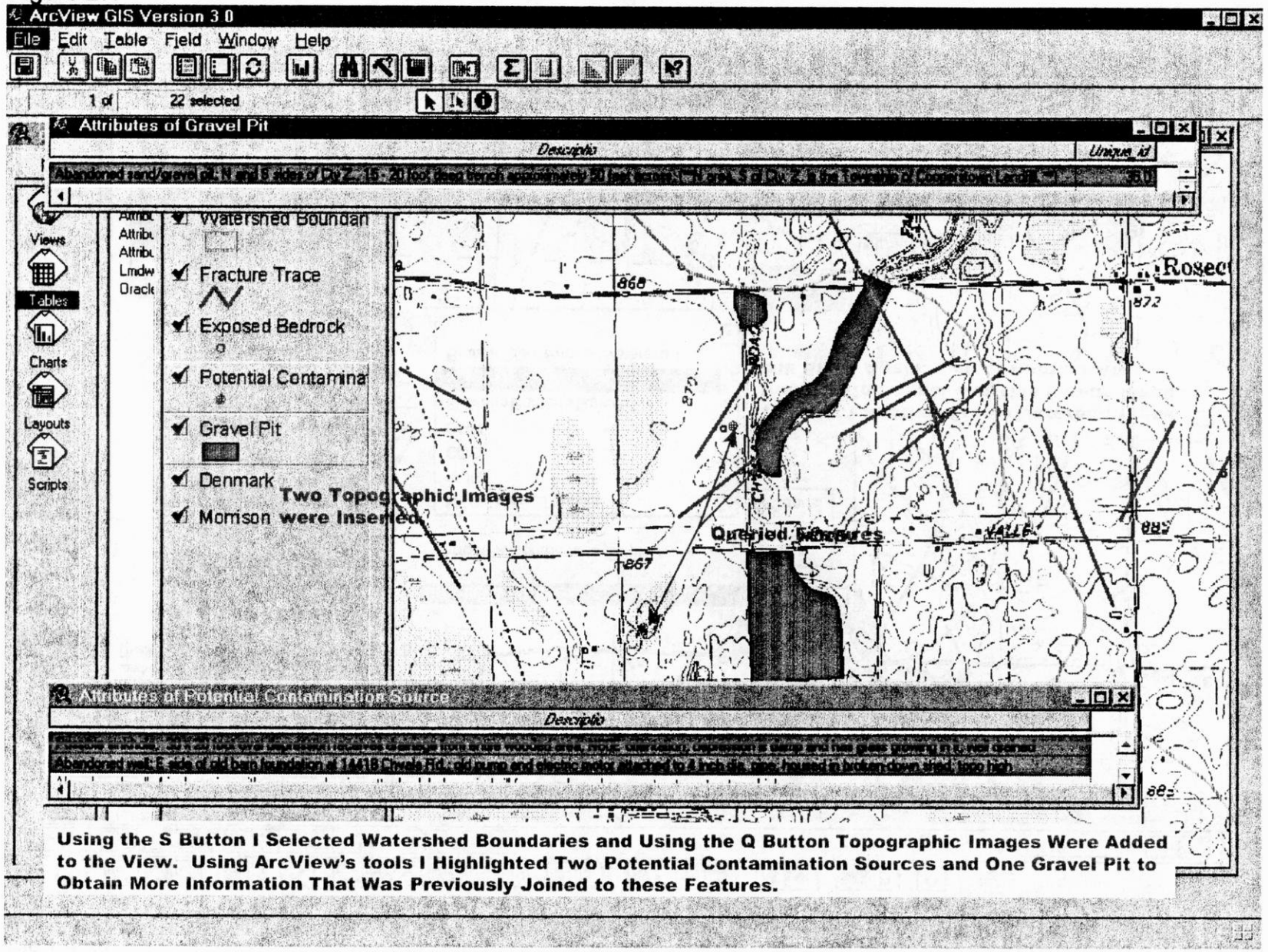
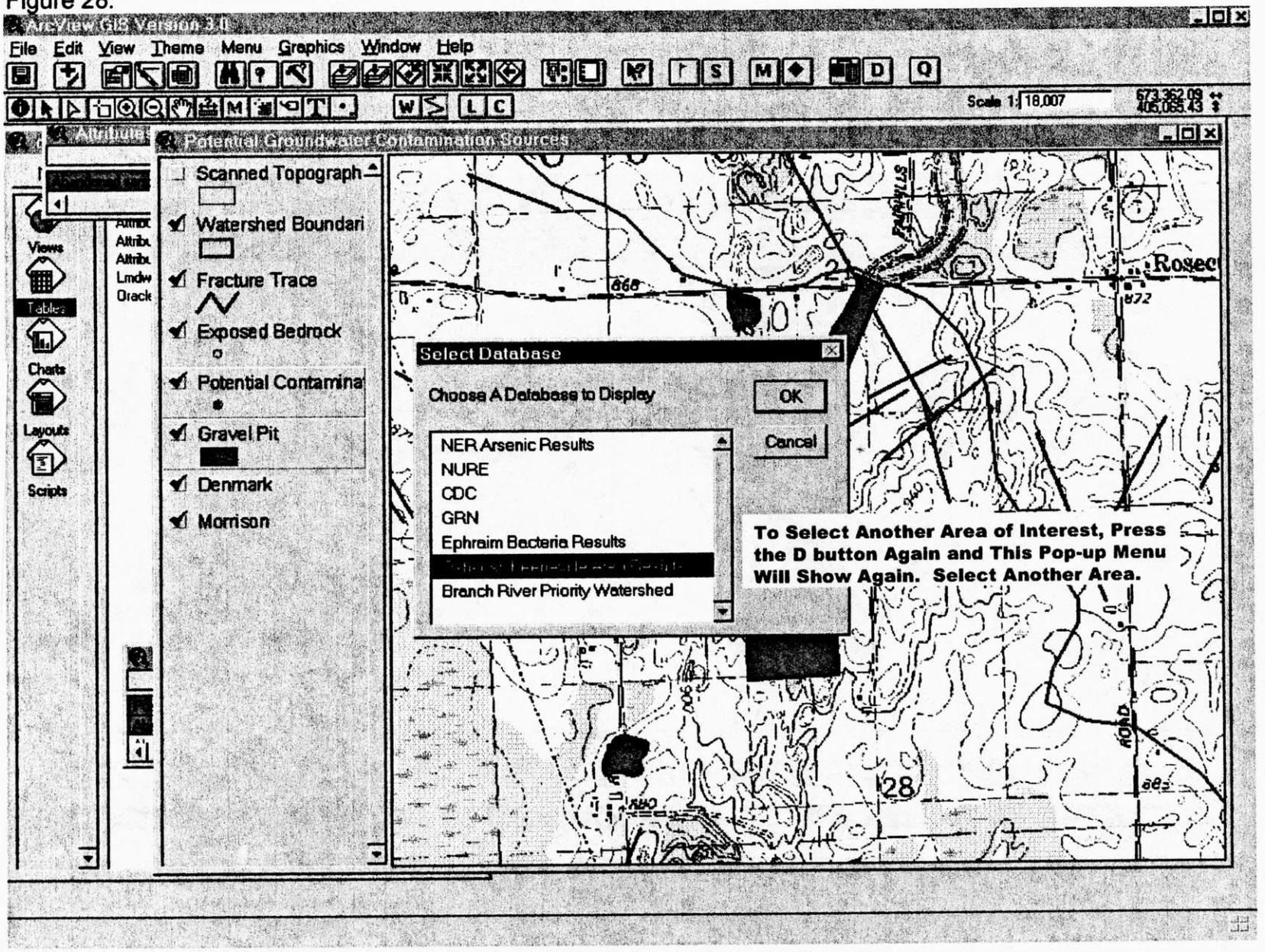
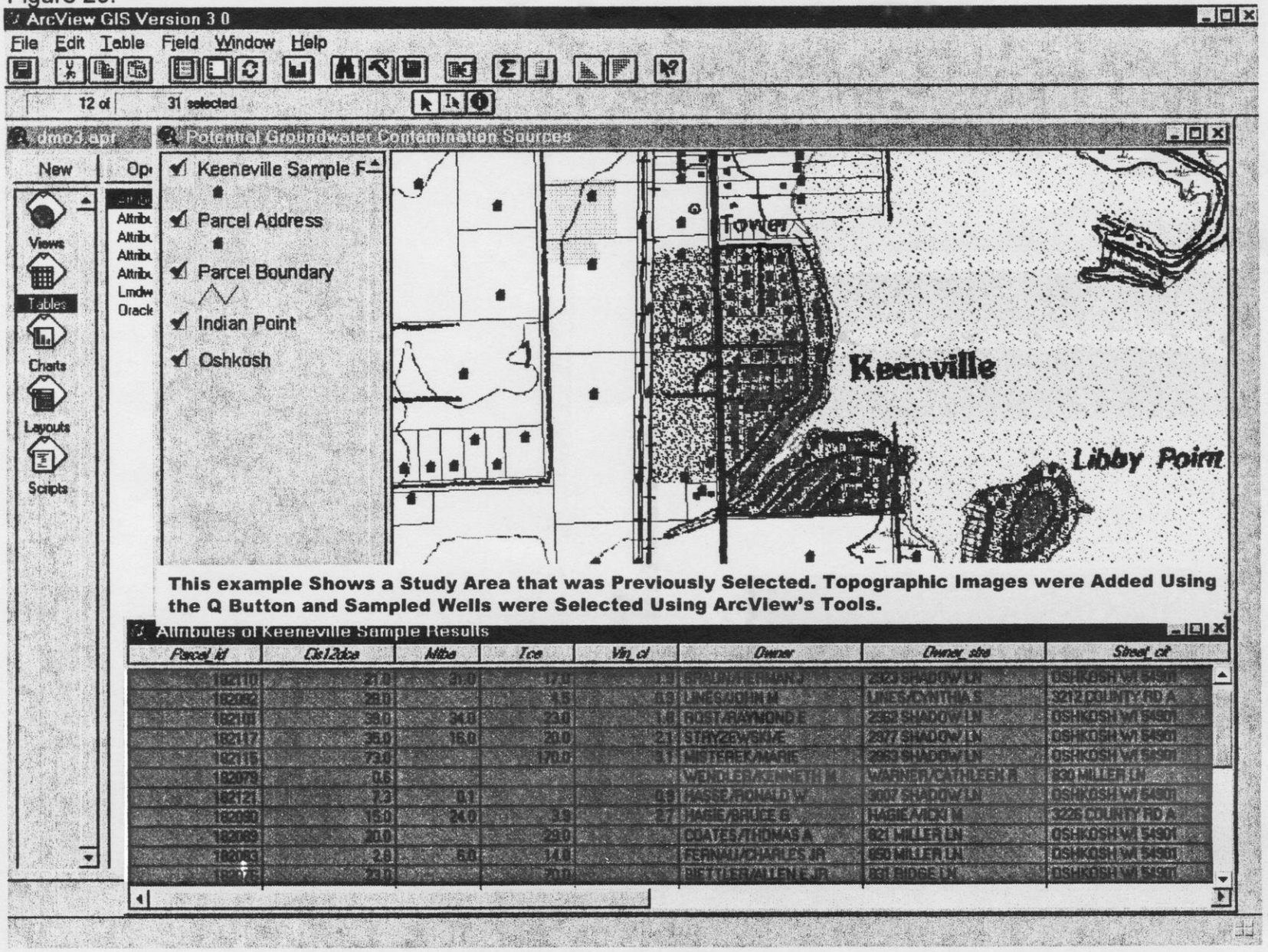

ArcView GIS Version 3.0
File Edit Table Field Window Help
1 of 22 selected
Attributes of Gravel Pit
Views
Tables
Charts
Layouts
Scripts
Watershed Boundari
Fracture Trace
Exposed Bedrock
Potential Contamina
Gravel Pit
Denmark
Morrison
Two Topographic Images were Inserted
Queried Features
Attributes of Potential Contamination Source
Using the S Button I Selected Watershed Boundaries and Using the Q Button Topographic Images Were Added to the View. Using ArcView's tools I Highlighted Two Potential Contamination Sources and One Gravel Pit to Obtain More Information That Was Previously Joined to these Features.

Figure 28.



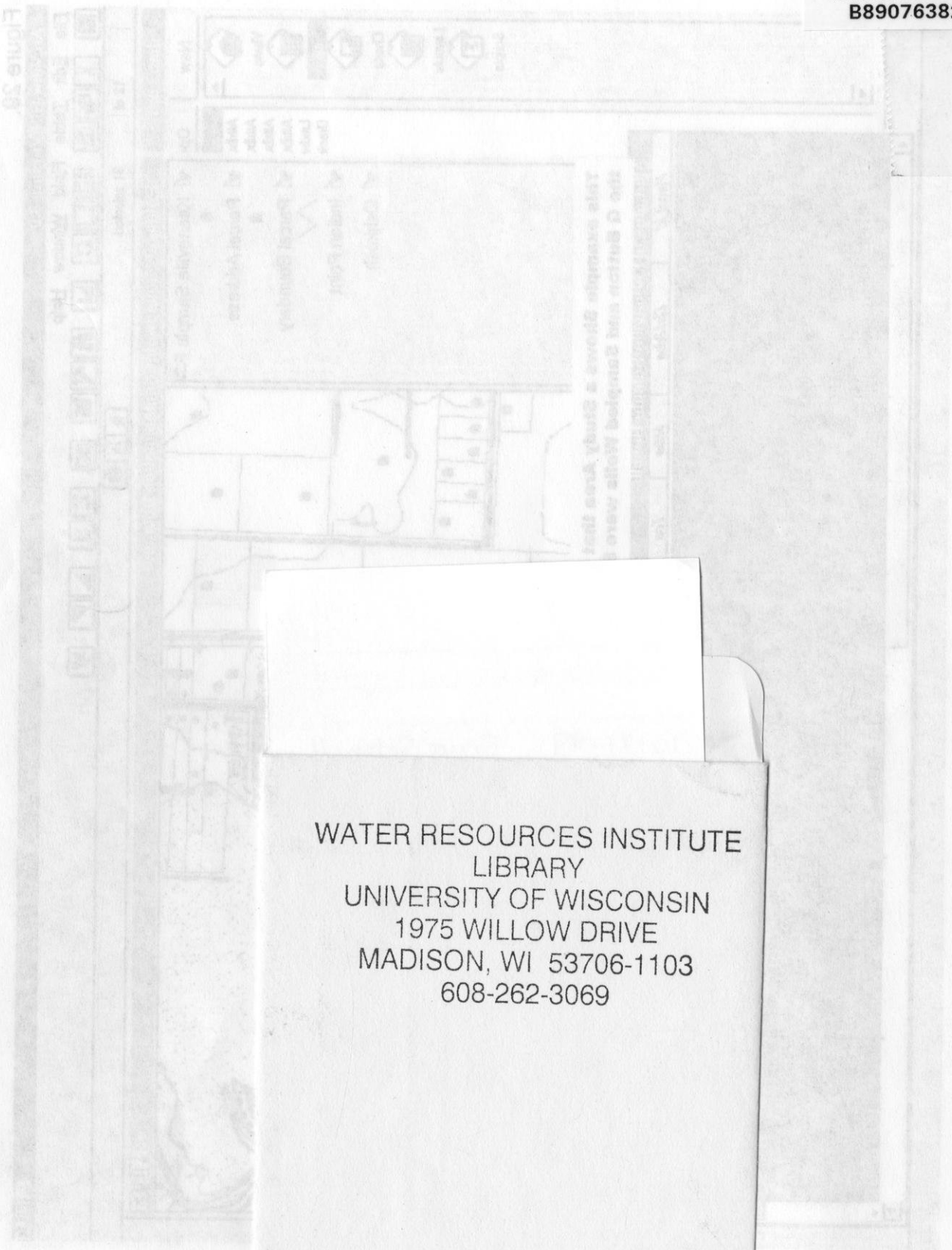
8907638245b
b89076382456a

Figure 29.


ArcView GIS Version 3.0
File Edit Table Field Window Help
12 of 31 selected
dmo3.apr
Potential Groundwater Contamination Sources
New
Views
Tables
Charts
Layouts
Scripts
Keeneville Sample F
Parcel Address
Parcel Boundary
Indian Point
Oshkosh
Tower
Keenville
Libby Point
This example Shows a Study Area that was Previously Selected. Topographic Images were Added Using the Q Button and Sampled Wells were Selected Using ArcView's Tools.
Attributes of Keeneville Sample Results
Parcel_id
Dist2dce
Mthe
Tce
Vin_cl
Owner
Owner_stre
Street_cit

89076382456

B89076382456A



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