Table Properties Window

The Table Properties window lets you view, create, and modify the properties of a database table, its component fields, and their relationships to fields in other tables.

Table Box

Controls in the Table box in the upper part of the Table Properties window set the properties of the table as a whole. You can enter or edit the table Name and Description in the corresponding text boxes. Turning on the *Hidden* toggle button means that the table is not included by default in lists of tables in the Display Manager. This setting is most appropriate for supporting tables that provide ancillary information for records in related tables and for picklist tables that provide lists of possible values that can be assigned to specific fields in related tables. (Hidden tables are visible in Database Editor views and can be included in table lists in the Display Manager by choosing the Show Hidden Tables option from the parent element's right mouse-button menu.)
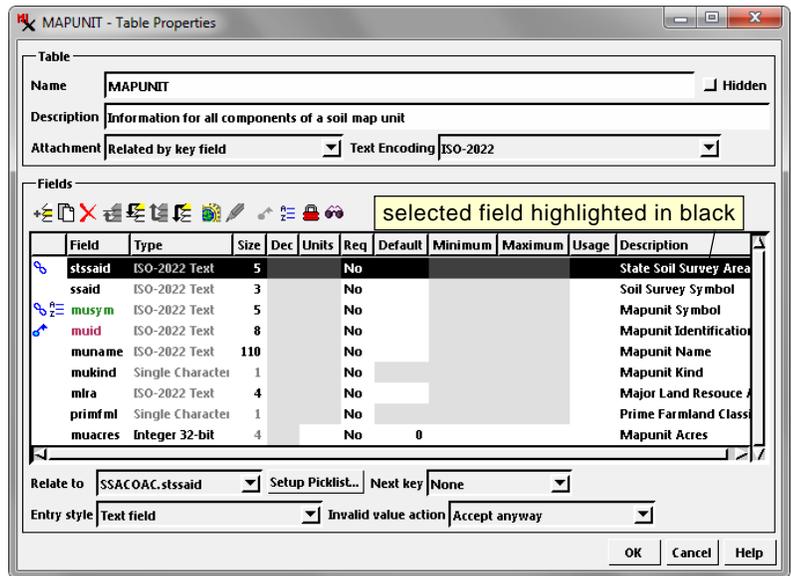
The Attachment menu choice sets restrictions on how records in the table can be attached to spatial elements in the parent object. The choices are shown to the right; see the Technical Guide entitled *Record Attachment Types* for more information. The option you select on the Text Encoding menu sets the encoding types available when you add a text field.

Fields Box

The Fields box shows a tabular listing of the fields in the table (rows) and their properties (columns, described in a table on the next page), including data constraints. Icon buttons above the tabular list are used to add, copy, or delete fields and to set certain field characteristics (see the illustration and table to the right).

You can add a field to a table by pressing the Add Field icon button, which reveals a menu showing the available field data types. The data type choices include Unicode text and text (in the encoding specified for the table), integer and floating-point types with choice of bit-depth, auto-increment (integer), and date and date/time fields (see table below for complete list and the TechGuide entitled *Field Types in Tables* for descriptions).

The selected option is shown in the Type field for the new field listing, which is added at the bottom of the list, and the cursor is placed in the Field column entry so you can enter a name for the new field.

Database Field Types

Unicode Text	Auto-increment
[encoding] Text	Simple Computed
Integer 32-bit	Logical
Integer 16-bit (-32768 to 32767)	Single Character
Integer 8-bit (-128 to 127)	Date
Integer 64-bit	Date/Time (Local)
Unsigned 16-bit (0 to 65535)	Date/Time (UTC)
Unsigned 8-bit (0 to 255)	Color
Floating-point 32-bit (6-digit precision)	Memo
Floating-point 64-bit (15-digit precision)	Binary

Attachment Types for Table Records

Any records to any elements	At most one record to one element
One record to multiple elements	Exactly one record for every element
Multiple Records to one element	Related by key field

Icon Buttons in the Fields Box
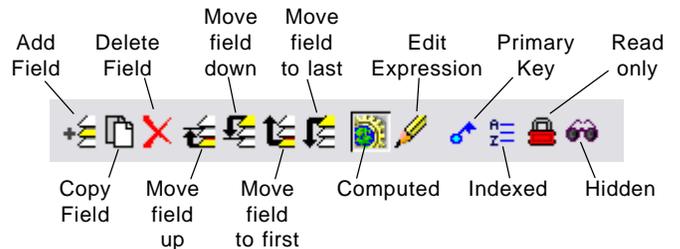
Button	Description
Add Field	Adds a new field at the bottom of the list with type selected from dropdown menu.
Copy Field	Adds a new field using data type and other settings from field selected in the list.
Delete Field	Delete the selected field.
Move field...	Move selected field in list as indicated.
Computed	Sets selected field to be computed numeric or computed text depending of field type already set.
Edit Expression	Opens script editor to allow creating or editing expression for the selected computed field.
Primary Key	Sets selected field as a primary key field.
Indexed	Creates an index on the selected field to speed up operations and queries that reference it.
Read only	Sets selected field as read-only (values not editable).
Hidden	Sets selected field to be hidden in table views.

mukind	Single Character	1		No	
mlra	ISO-2022 Text	4		No	
primfml	Single Character	1		No	
muacres	Integer 32-bit	4		No	0
	Unicode Text	100		No	

New field added; the field name text box is automatically activated for entry of the name.

You can also create a new field that has the properties of an existing field. Select the desired model field by clicking on the field name; its field entries are highlighted with a black background. Pressing the Copy Field icon button creates a new field entry immediately below the model field with the cursor placed in the Field column entry so you can enter a name for the new field.

If you select an incorrect data type for a new field, you can left-click on the Type field entry to reopen the data type menu and choose the correct entry. Once you press the OK button on the Table Properties window, however, most field data types become fixed and cannot be changed; their entries in the Type column are shown in gray, and no data type menu is available from these entries. The exceptions are Integer 32-bit, Auto-increment, and Date fields, which have Type entries shown in black text; left-clicking on such an entry opens the Type menu allowing you to change the data type to either of the other types in this group.

Values for field properties are set in different ways depending on the property. Some properties are numeric or text entries that can be entered or edited directly by selecting the field in the list and left-clicking in the appropriate property column. Direct-entry properties include Size for text and numeric fields; Dec, Default, Minimum, and Maximum properties for numeric fields; and the Description property.

The Req (for Required) property can be toggled between No and Yes simply by left-clicking on the column entry. Clicking on the Units or Usage entry opens a menu from which to choose the desired value.

Some field properties and constraints apply only to specific data types. Properties that are not available to be set for a particular field are shown with a gray background in the list.

	Field	Type	Size	Dec	Units	Req	Default	Minimum	Maximum
🔗	stssaid	ISO-2022 Text	5			No			
	ssaid	ISO-2022 Text	3			No			
🔗	musym	ISO-2022 Text	5			No			
🔑	muid	ISO-2022 Text	8			No			
	muname	ISO-2022 Text	110			No			
	mukind	Single Character	1			No			
	mlra	ISO-2022 Text	4			No			
	primfml	Single Character	1			No			
	muacres	Integer 32-bit	4			No	0		

Gray background color indicates properties and constraints not applicable to particular field types.

Computed Fields Two types of computed field are supported: computed numeric and computed text. Computed fields do not store values, but instead show a value that is derived dynamically from a numeric or string expression you provide. These expressions can reference other fields in this or a related table, numeric or string variables, constants, and various operators. Any changes in values in fields referenced by a computed field are automatically reflected in the computed field value shown.

Field Properties		
Status	Unlabeled column showing field status via symbols identified by ToolTip:	
	🔑 primary key 🔗 related 🔤 indexed	
	∓ computed 🔒 read-only •• hidden	
Field	Field name (click entry to edit)	
Type	Data type (set when field is created)	
Size	Maximum number of characters for text fields; size in bytes for other field types (click entry to edit)	
Dec	Number of decimal places shown for floating-point numeric fields; not applicable to other field types (click entry to edit)	
Units	Units for values as stored in record; applies only to numeric fields (click entry for menu to choose)	
Req	Sets whether a value is required if no default (click entry to toggle No / Yes)	
Default	Default value for numeric field; next value to use for auto-increment field (click entry to edit)	
Minimum	Minimum allowed value for numeric field (click entry to edit)	
Maximum	Maximum allowed value for numeric field (click entry to edit)	
Usage	Predefined field usage; available choices depend on field type (click entry for menu to choose)	
Description	Description of field contents. If provided, shown along with field name in DataTip on field name in tabular views (click entry to edit)	

To create a computed field, first add the field with the desired numeric or text data type. With the field selected in the list, press the Computed icon button. The Query Editor automatically opens so you can enter the numeric or string expression for the computed field. The computed nature of the field is indicated by an icon in the unlabeled status column on the left side of the list (see table above for an illustration of the status icons) and by the blue font color used for the field name. Press the Edit Expression icon button to reopen the Query Editor to edit the expression if needed.

You can also create a new computed field that simply references a field in this or any related table by choosing the Simple Computed option from the Add Field icon button's menu. You are then prompted to choose the table and field. This operation automatically creates either a computed numeric or compute text field depending on the type of field you select as the reference. The new computed field then shows the values from the referenced

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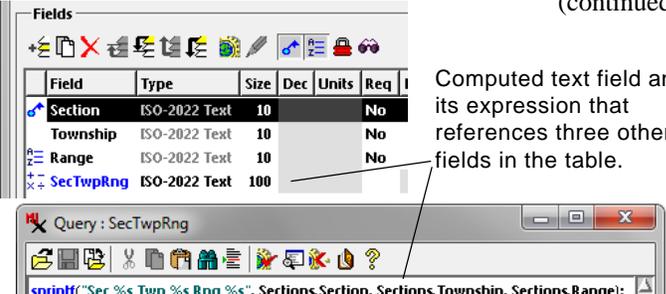
Computed text field and its expression that references three other fields in the table.

field. You can also edit the expression that was generated for the simple computed field to create a more complex expression if desired. See the TechGuide entitled *Computed Numeric and Text Fields* for more information.

Primary Key A primary key identifies data that is unique to each record in the table. A primary key may consist of a single field containing unique values (such as a property identification number) or multiple fields in combination (such as fields with street numbers, street names, and street type that in combination form a unique street address). Primary key fields are the basis for establishing relationships between records in different tables (see the Foreign Key section below).

You can designate a selected field as a primary key field by pressing the Primary Key icon button; the primary key symbol is then added to the field's entry in the Status column and the field name is shown with a purple font color.

To create a composite primary key made up of more than one field, set the first field as the primary key field, then use the Next Key menu below the field list to choose the next field in the combination. For each additional field in the complex key, select the previous "next key" field in the list and use the Next Key menu to add a field to the primary key. For composite primary keys only the first field is indicated by the primary key status icon and field name color.
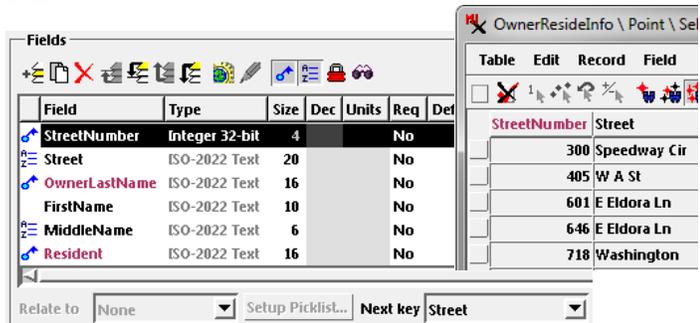
In the table shown above, fields StreetNumber and Street make up a composite primary key. With the StreetNumber field selected and set as primary key, the Street field was selected from the *Next key* menu to create the composite primary key.

Foreign Key A foreign key field contains the same information as a primary key field in another table in the database. Identical primary key and foreign key values for a pair of records in the two tables allow these records to be *related*. If the table with the pri-

mary key has records directly attached to elements in a spatial object, then records in the related table (containing the foreign key field) are also related to the spatial elements.

You can set a selected field in a table as a foreign key field using the *Relate to* menu below the field list. This menu lists all of the primary key fields in the database (in the form Tablename.Fieldname). It is good practice to use the same field name for the foreign key field and its related primary key field in the other table, but this is not required in the TNT products. When you have chosen the related primary key field, the "related" icon is added to the status column for the selected field, and its field name is shown with a green font color. Pausing the mouse over the field name in the list shows a DataTip with the table name and field name of the related primary key field.

Picklists A *picklist* is a window that shows the list of available text values that can be assigned to a text field in a single-record view of a table (see illustration at the top of the next page). Picklists make use of key field relationships between a pair of tables. The values shown in the picklist come from the primary key field in a designated picklist table. The field to be populated is in another table (referred to in this discussion as the target table) and is set as a foreign key field related to the picklist field. The picklist can be used to change values for the field in existing records in the target table or to assign values when new records are added. Choosing a value in the picklist window immediately updates the field value in the target table.

A picklist is automatically available in single-record view for any text field that has a foreign-key relationship with a primary key field in another table. Picklist availability is shown by a small right-arrow icon button in the column to the right of the field name in single-record view. Press this arrow button to open the picklist window.

If you would like to set up a picklist for a text field, you can do so easily from the table's Table Properties window. Simply select the field in the list and press the Setup Picklist pushbutton to launch the Create Picklist wizard, which guides you in step-by-step fashion through the process. This procedure creates a new picklist table, sets up the proper key field relationships between the two tables, and allows you to define the list of picklist choices.

The Setup Picklist button is only active if a text field is selected, and the target field cannot be a primary key field because it needs

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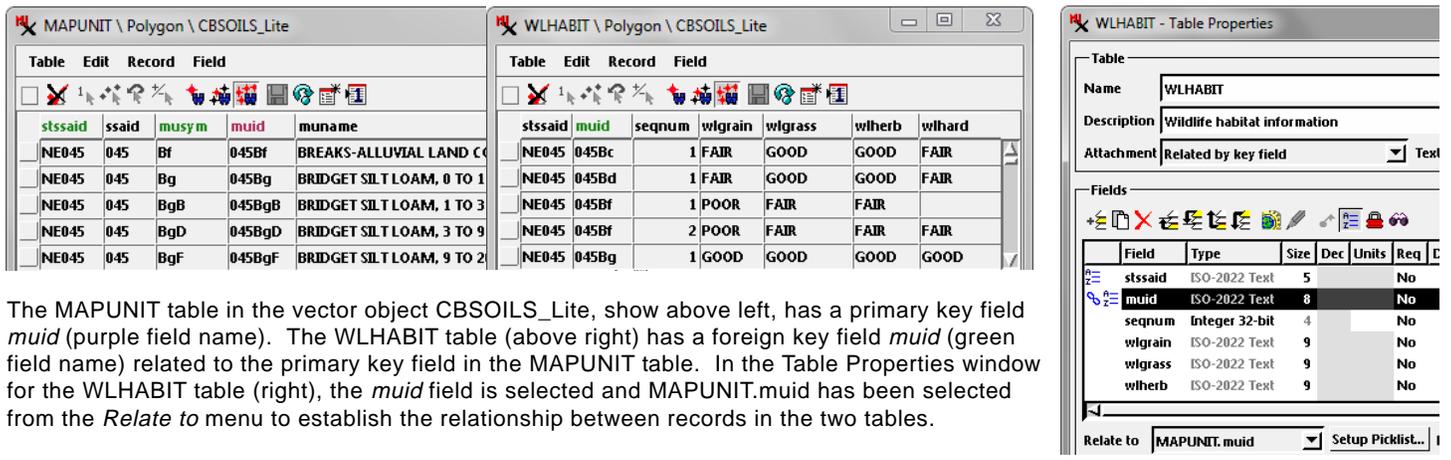
The MAPUNIT table in the vector object CBSOILS_Lite, show above left, has a primary key field *muid* (purple field name). The WLHABIT table (above right) has a foreign key field *muid* (green field name) related to the primary key field in the MAPUNIT table. In the Table Properties window for the WLHABIT table (right), the *muid* field is selected and MAPUNIT.muid has been selected from the *Relate to* menu to establish the relationship between records in the two tables.

Picklist Example
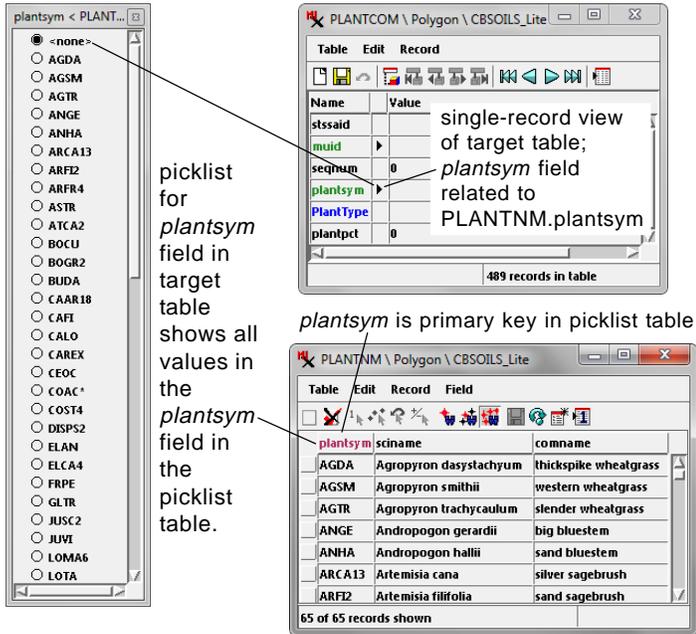
picklist for *plantsym* field in target table shows all values in the *plantsym* field in the picklist table.

single-record view of target table; *plantsym* field related to PLANTNM.plantsym

plantsym is primary key in picklist table

Related text field in tabular view with Text Entry option for the *plantsym* field set to *Popup list of choices*.

Related text field in tabular view with Text Entry option for *plantsym* field set to *Text field with popup list*.

A picklist is automatically available in single-record view for any text field that has a foreign-key relation with a primary key field in another table, as indicated by the arrow icon to the right of the field name. Press the arrow icon to open the picklist, which shows all of the values from the primary key field in the picklist table. Choosing a value in the picklist window immediately update the field value in the target table. You can press the Setup Picklist pushbutton in the target table to launch a wizard to create a picklist table with the proper relationships.

to be related to the primary key field in the new picklist table. For more information about picklists, see the *Database* Technical Guides entitled *Picklists Provide Easy Assignment of Attributes*, *Wizard to Create a New Picklist*, and *Picklist Relational Structure*.

Entry Style The *Entry style* menu sets a broader range of text entry options for text fields with a foreign key relation to a key field in another table that provides the list of valid values. Unlike the default Picklist method, which is available only in single-record views, these text entry options are available in tabular views (and some in single-record views as well) of the target table. Settings on the *Entry style* menu that invoke menu selection override the default picklist behavior in single-record views, but eligible fields in single-record views retain the right-arrow icon button regardless of the *Entry style* menu choice.

Two of the *Entry style* menu options set up the field to present a list of attribute choices for selection. The *Popup list of choices* option adds a down-arrow icon button to the field in tabular view (see illustration at top of next column); pressing this button drops down a menu with the list of text attribute choices from the related table. If there are a large number of possible attribute values this long menu can be impractical to use. The *Text field with popup list* option is a better choice in such cases. This option allows direct entry/editing of the text and also adds an icon button with the symbol [...] to the field in tabular views, which when pressed opens a separate Selection window with a scrolled list of choices. This window is similar in appearance to the Picklist window but opens
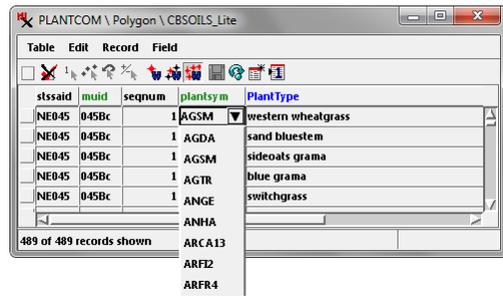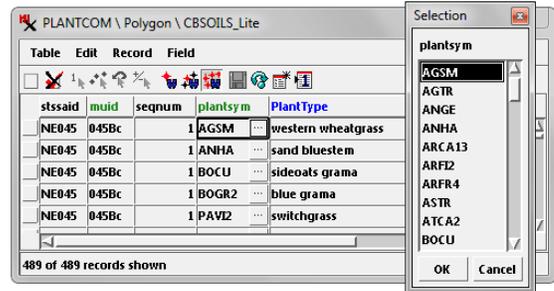
separately for each field value being changed, and requires pressing the OK button to change the field value. Although these two popup list options produce different selection methods in tabular views, in single-record views both produce a simple dropdown menu.

The *Text field* choice from the *Entry style* menu applies only to tabular views. It sets up simple text entry for the text field, but allows the option to validate entered values using the list in the related field. Validation options are set using the *Invalid value action* menu. If the entered value does not match an attribute value already in the list, the *Accept anyway* action option accepts the entry without further action, while the *Show error message* option causes an error message window to open to warn of the mismatch. The *Add new record with defaults* option adds a new record to the table with the value list, adding the entered attribute value in the primary key field and using default values for any other fields in the linked table. The *Prompt and add new record* option shows a prompt window that allows the user to accept or cancel adding the new record to the list table.

Two additional text entry choices are included for specialized applications that allow selecting multiple text entries for a field from

a list: *Multiple-choice, allow duplicates* and *Multiple-choice, unique values*. These options invoke a two-column selection list window (shown to the right) that allows building a set of selected values in the right column from the list of possible values in the left column, as well as buttons to change the order of the selected list.