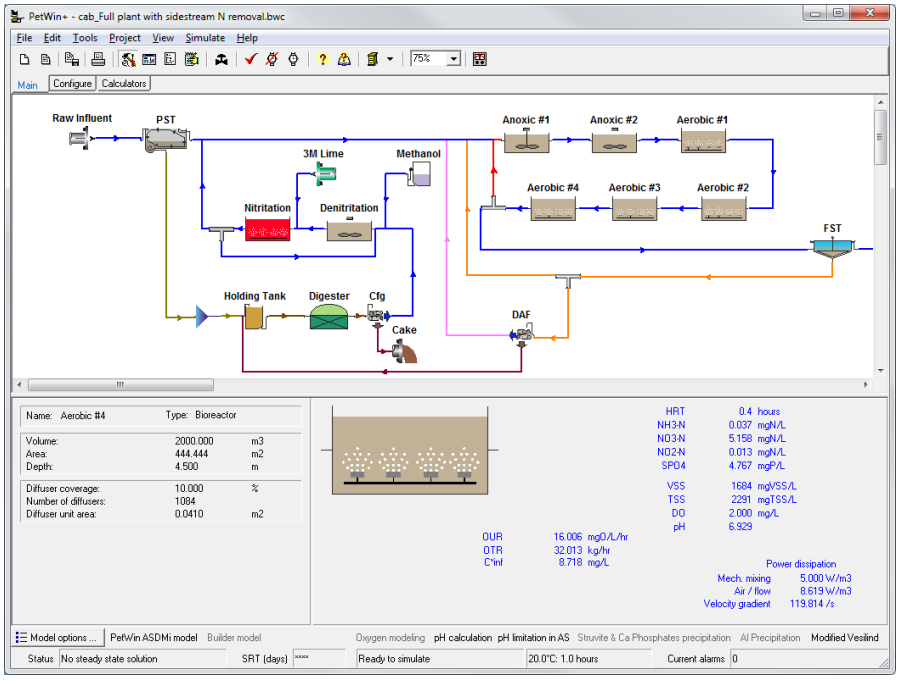
PetWin+ : Quick Feature Tour

Welcome to PetWin+

This chapter highlights some of the features available in PetWin+. These are demonstrated using the "An Example.pwc" configuration installed in the **Data** folder of the PetWin+ installation directory. The purpose of this chapter is to provide a brief introduction.

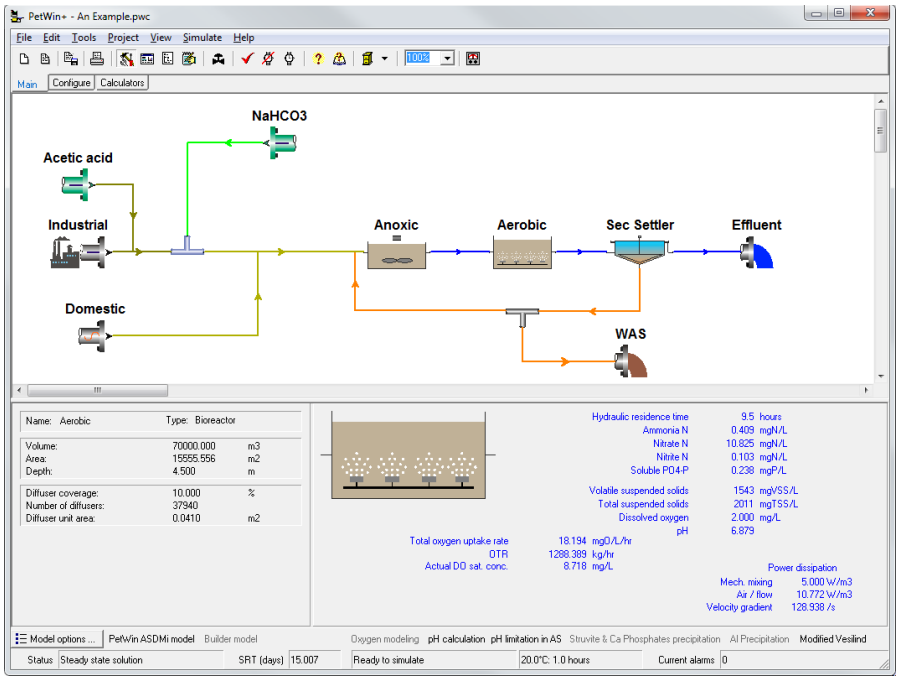
For specific examples on using PetWin+, please see **PetWin+ Tutorials**. You can find more PetWin+ examples as follows:

Select **File|Open** and browse to the **Examples** directory. Some of these systems are discussed in the **PetWin+ Examples** section of the **Help** chapter. On the PetWin+ main window toolbar, at the end on the right, click on the arrow next to the icon that looks like a filing cabinet. This brings down a list of pre-configured PetWin+ process files for a range of system configurations.



The Interface

The example system shown below is a simple two-reactor activated sludge configuration.



A two-reactor activated sludge configuration with industrial and domestic influent

The PetWin+ main simulator window interface consists of:

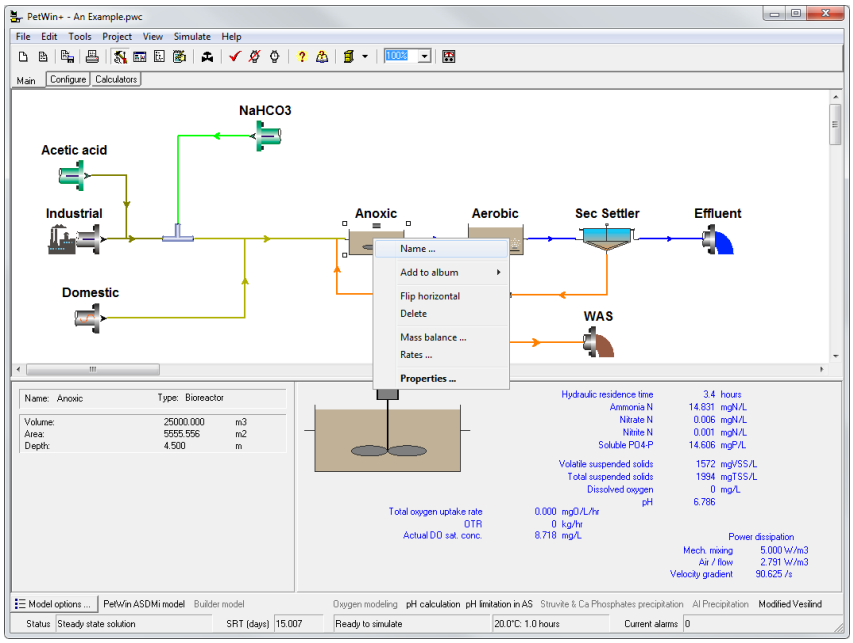
- Menus
- Toolbars
- Drawing Board
- Summary Panes
- Status Bar

Setting up such a system is easy to do – it's a matter of minutes. Buttons on the toolbar at the top of the main simulator window represent the various unit processes available in PetWin+. Simply click on a button, move your mouse cursor over the area on the drawing board where you want to place an element, and click the mouse button.

Most types of wastewater treatment systems can be configured in PetWin+ using the many process modules. These include:

- Several different kinds of input elements – industrial wastewater influent (COD-based), domestic wastewater influent (COD- or BOD-based), user-defined (state variable concentrations), metal addition for chemical phosphorus precipitation (ferric or alum), methanol for denitrification.
- A range of activated sludge bioreactor modules – suspended growth reactors (diffused air or surface aeration), various SBRs, media reactors for IFAS and MBBR systems, variable volume reactors.
- Anaerobic and aerobic digesters.
- Various settling tank modules – primary, ideal and 1-D model settlers.
- Other process modules – holding tanks, equalization tanks, dewatering units, flow splitters and combiners.

A quick way to gain access to local menus which contain commands specific to a particular object is through the use of the right mouse button. For example, if you point to a bioreactor element and right-click, you will get a local menu as shown below.

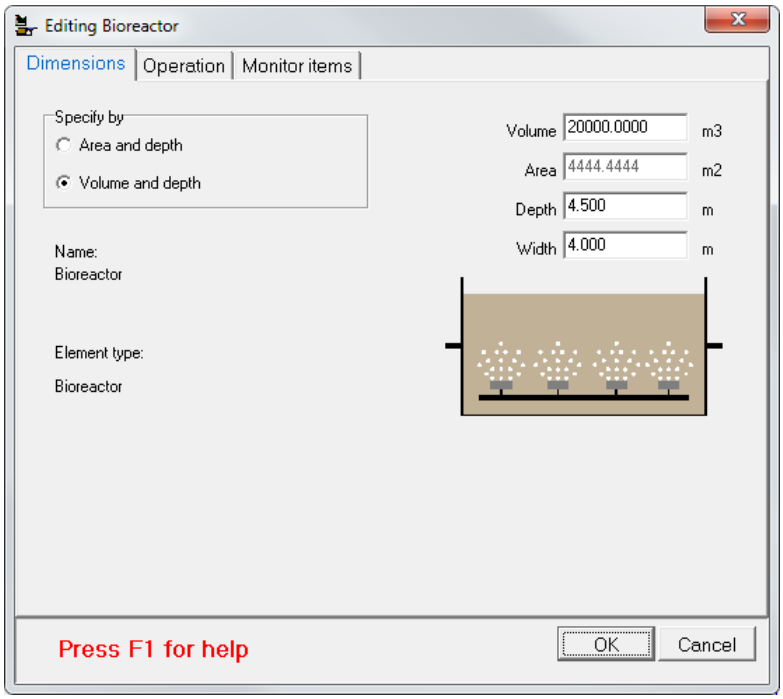


Using the right mouse button gives access to local menus

Note : For more information on the **PetWin+ interface**, please see the **Main Simulator Window** section of the **General Operation** chapter.

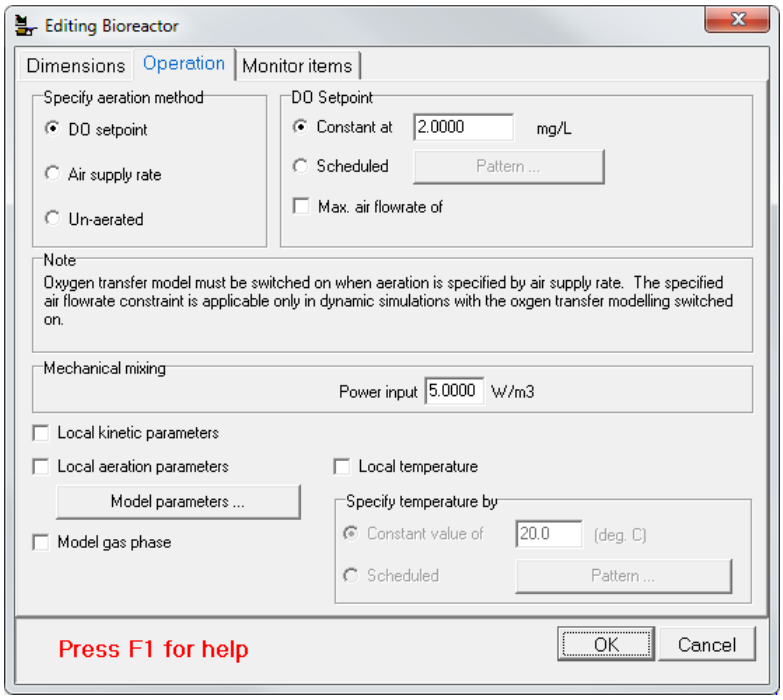
Element Information

Double-clicking on a drawing board icon for an element in a configuration gives access to all pertinent information for that element. For example, double-clicking on a bioreactor element allows access to physical and operational data, as well as the facility to set up data monitoring.



Dialog box allows access to all bioreactor information

Once you have double-clicked on an element icon to gain access to this information, it is just a matter of clicking on the tab you are interested in. For example, clicking on the **Operation** tab will allow you to change the bioreactor operating parameters shown below.

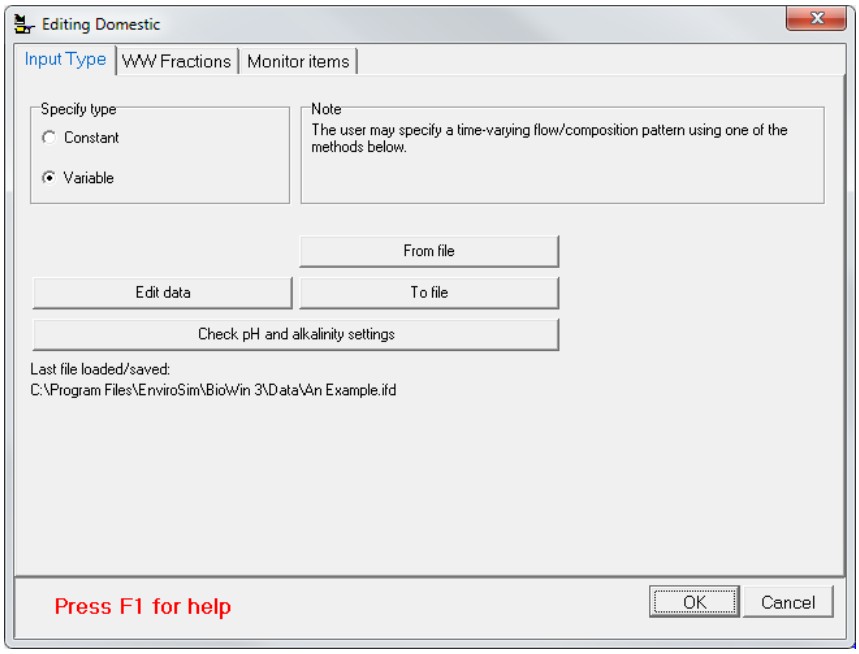


The bioreactor operation tab

Note : For more information on the **Element Information**, please see the Element Descriptions section of the Building Configurations|group=04building chapter.

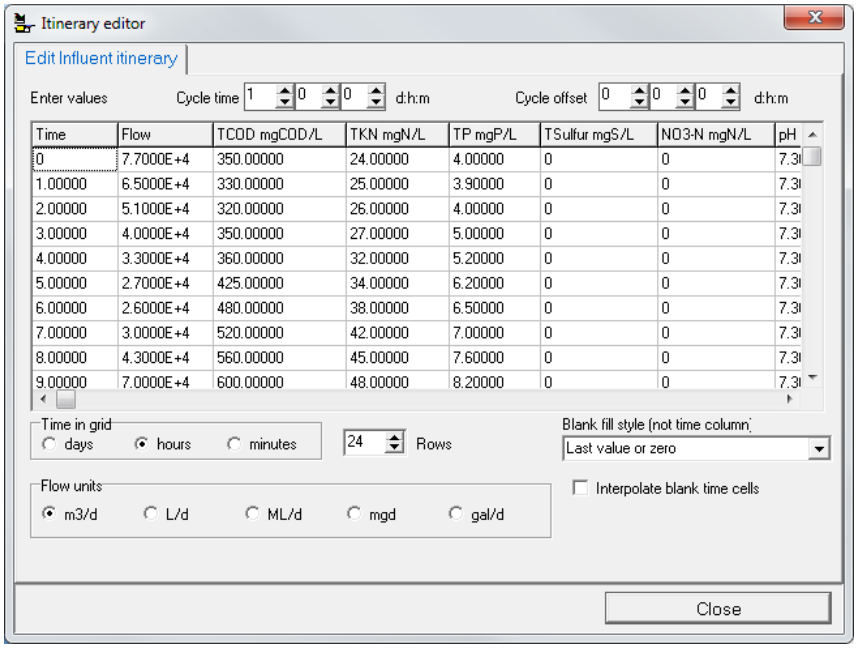
Influent Data

Setting up influent data is a quick and easy process. In the "An Example.pwc" example there are four influent elements (three different types of influent). Two of the influents are State Variable influent elements which are used, in this case, to add acetic acid and sodium bicarbonate. The other two influent elements allow the user to specify the influent composition in terms of total and fraction values. The COD influent element provides fractions that are intended to describe traditional municipal or domestic wastewaters, although it is flexible enough to be used for other sorts of influent wastewaters too. The Industrial COD influent is intended to be used to describe influent streams that are primarily industrial in nature. If you double-click on Domestic influent element drawing board icon, you will see the following dialog box.



Access the influent properties to set up influent data

Clicking the **Edit data** button as shown will open the **Influent itinerary editor**, as shown below.



The variable influent itinerary editor

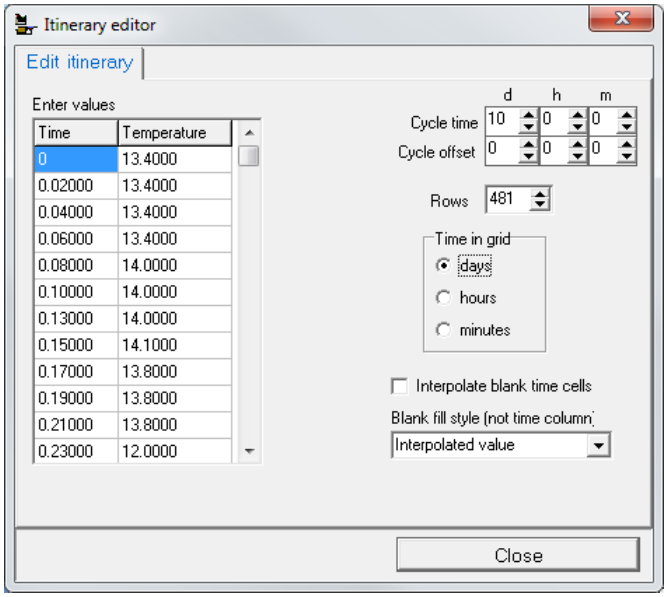
The **Influent itinerary editor** provides a spreadsheet-like interface for entering data. PetWin+ even offers several different strategies for filling in blanks in your data. It is very easy to import data into the itinerary editor from files or to copy it in from a spreadsheet – in fact, the data in the example shown above were pasted in from Microsoft Excel™.

Note : For more information on **Influent Data**, please see the **Influents** section of the **Building Configurations** chapter.

Running A Simulation

Steady state and dynamic simulations are run from the main simulator window. Once you have taken a few minutes to specify information for the various elements in your configuration, commencing a simulation is simply a matter of clicking the appropriate button (or) on the toolbar.

PetWin+ uses a powerful itinerary that allows the user to schedule many different operating conditions such as dissolved oxygen setpoints, airflow rates, and temperature. For example, suppose that you were simulating varying temperature conditions. With PetWin+, you easily can set up a temperature schedule using the dialog box shown below.



Scheduling operating conditions is straight-forward.

Note : For more information on **Running a Simulation**, please see the **Running Simulations** chapter.

Help and Manual

PetWin+ comes with an extensive manual which is shipped in the form of one complete Adobe PDF document consisting of several chapters so you can easily print out the sections of specific interest.

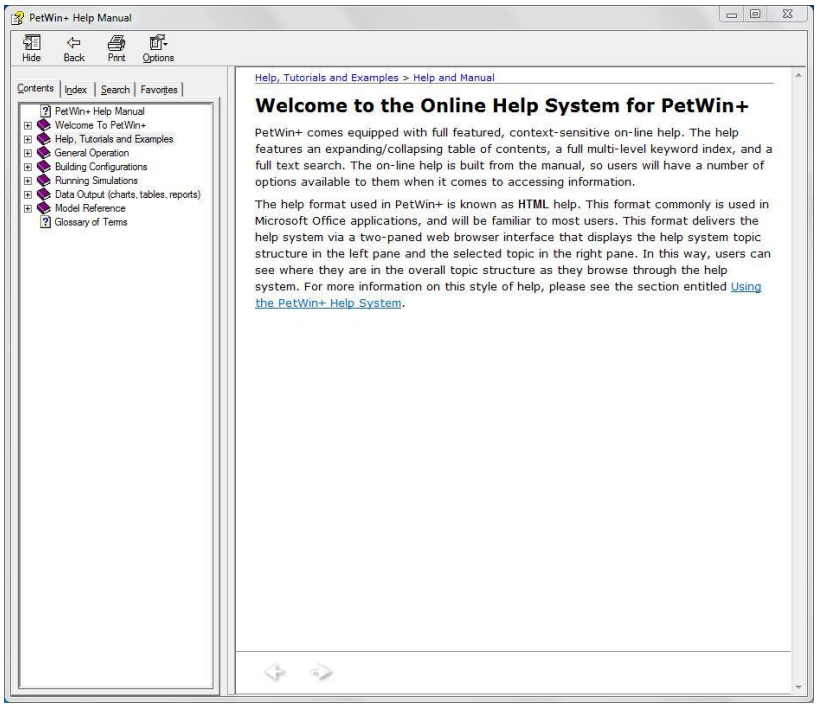
You may find this unnecessary as the contents of this manual are available via PetWin+'s online help. You can access this help system via the toolbar help buttons :

: Help Contents and Index

: Help on Using Help

Another useful feature that makes PetWin+ easy to learn is context-sensitive help. To get help that is relevant to a particular dialog box you are working in, simply hit the **F1** key and PetWin+ will access related topics from the help system and display them to you.

A screen shot of the help system is shown below.



A PetWin+ help window (Contents tab showing)

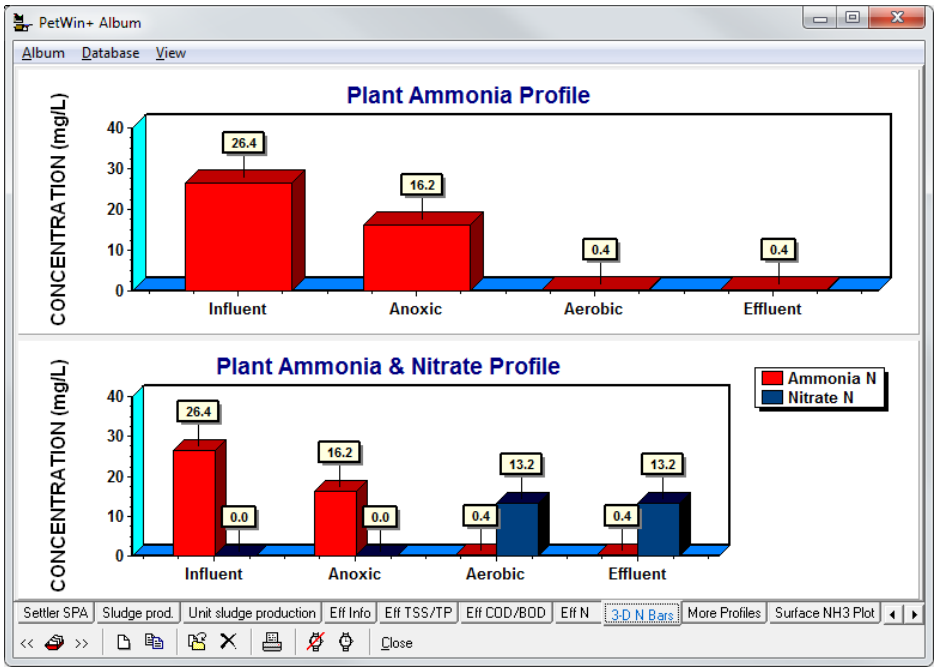
Note : For more information on **Help and the Manual**, please see the **Help, Tutorials and Examples** chapter.

Viewing Simulation Results

The PetWin+ Album provides a fully integrated means to display simulation results. Using the album you can view data in the following formats:

- **Tables**
- **Element-specific information displays**
- **Charts**

Activating the album is as simple as clicking the appropriate button ( ) on the main window toolbar. The album consists of a series of tabbed pages which may contain any or a combination of the above data display formats. Shown below is the album with the active page displaying a chart.

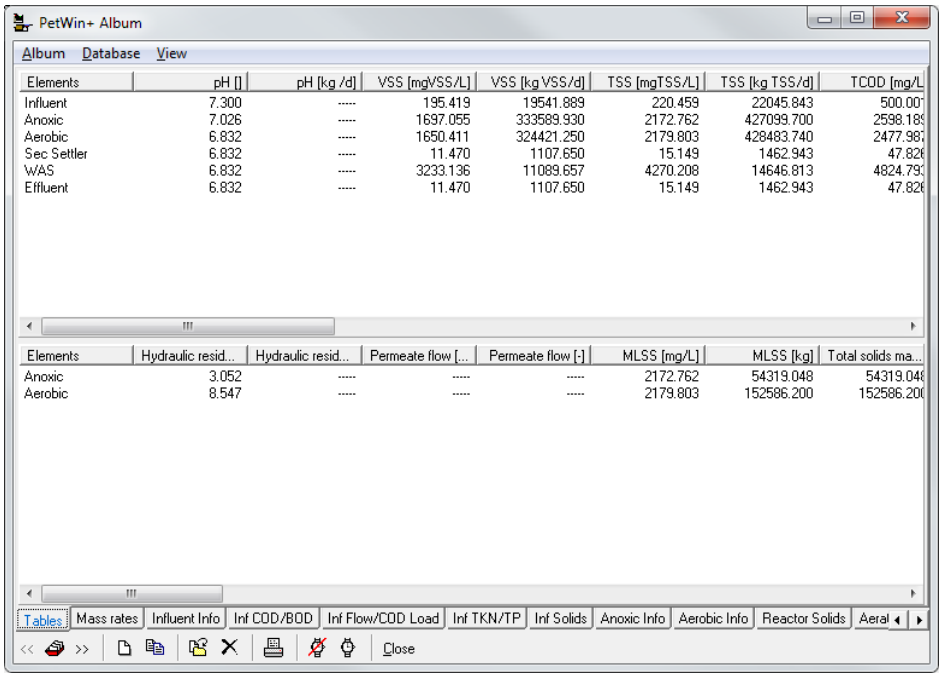


The album interface

Note : For more information on **Viewing Simulation Results**, please see the **Data Output (charts, tables, reports)** chapter.

Tables

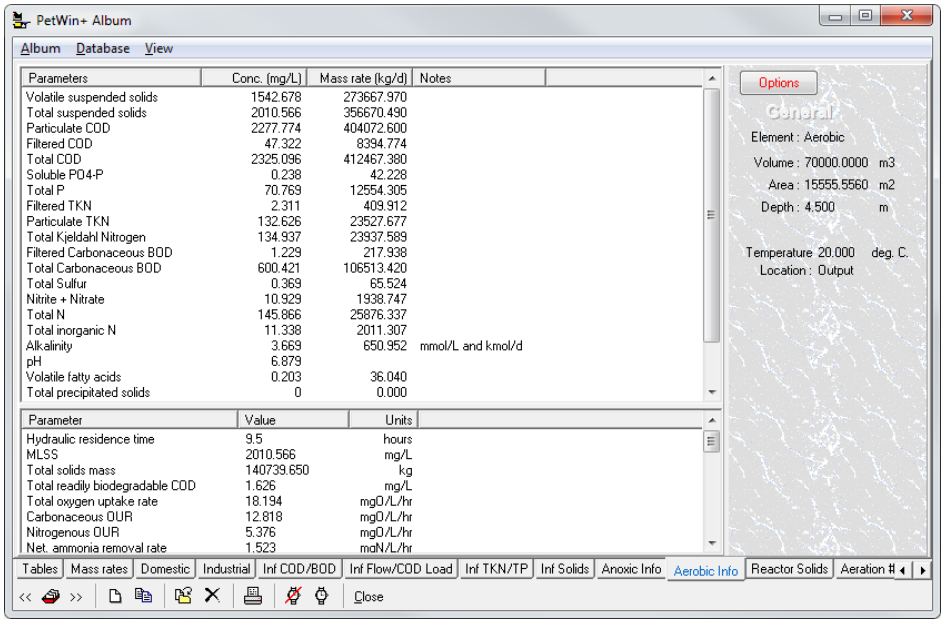
Here is an example of an album page containing two tables.



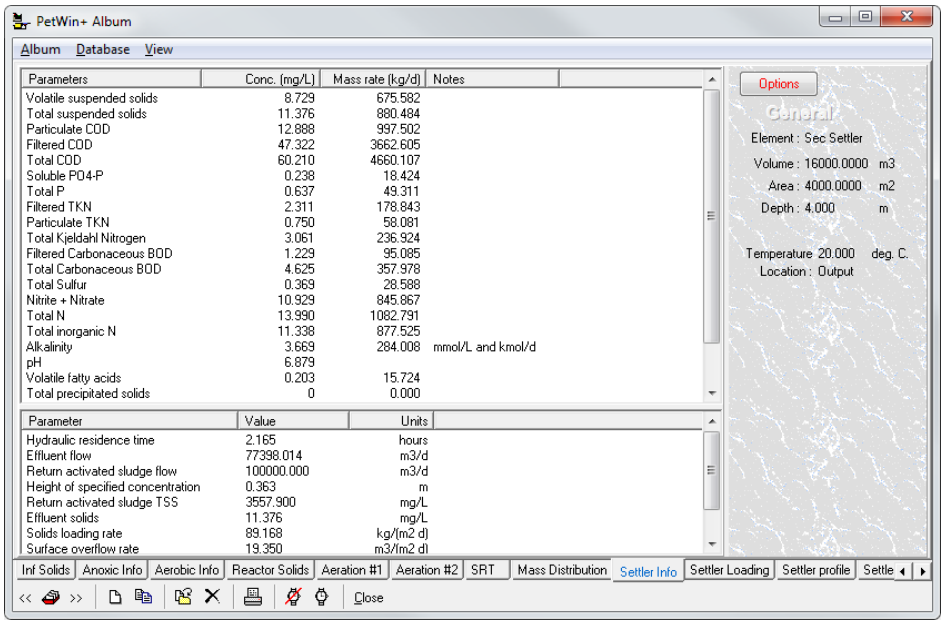
An album page containing two tables

Element-Specific Information

Here are two examples of element-specific information displays; one for a bioreactor element and one for a settling tank element.



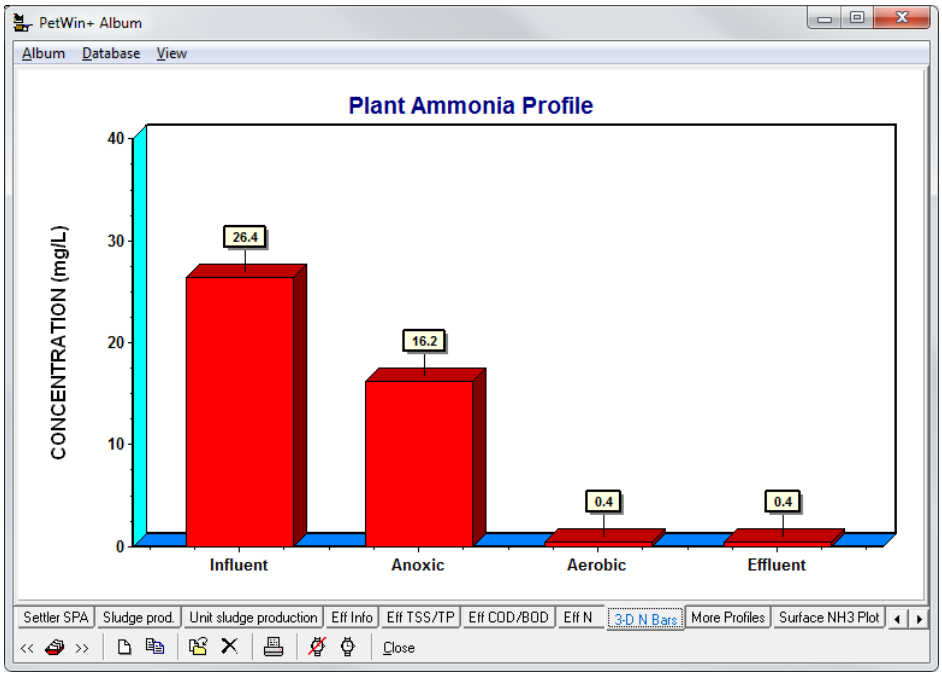
A bioreactor element-specific information display



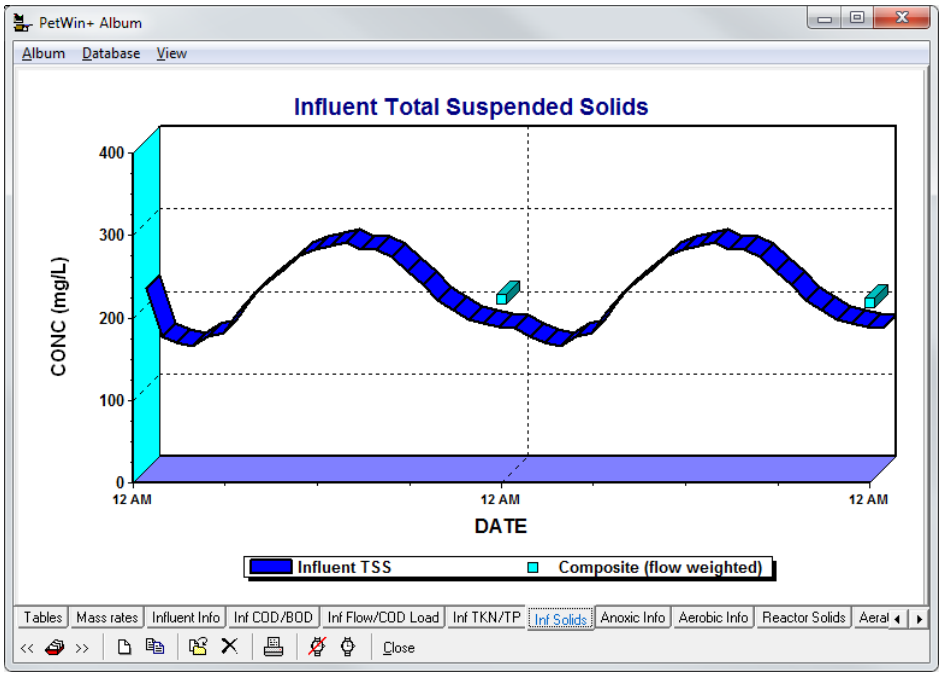
A settling tank element-specific information display

Charts

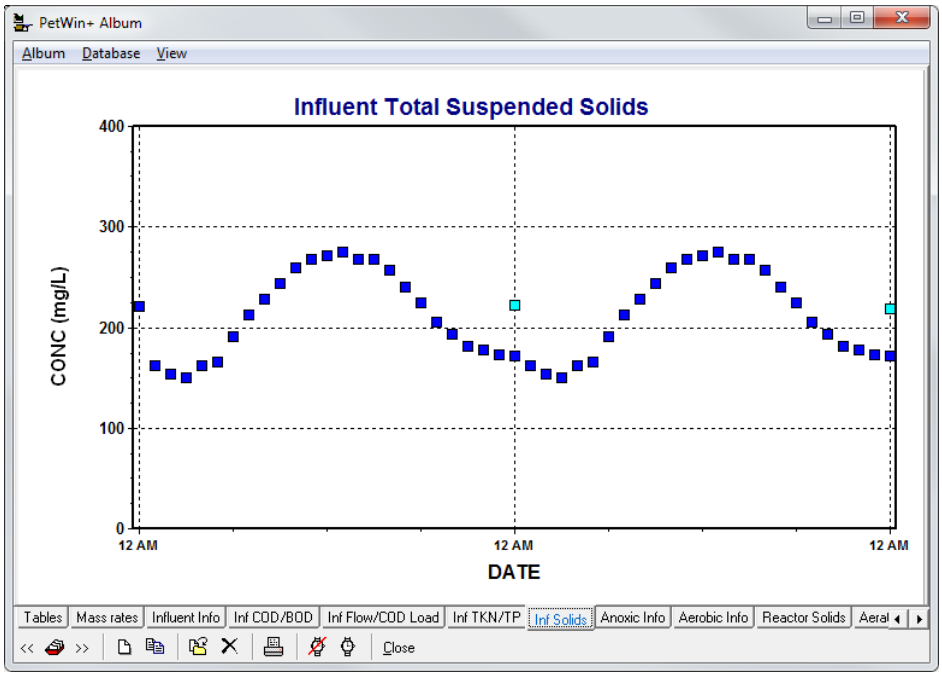
PetWin+ offers a wide variety of charting options. Here are some examples.



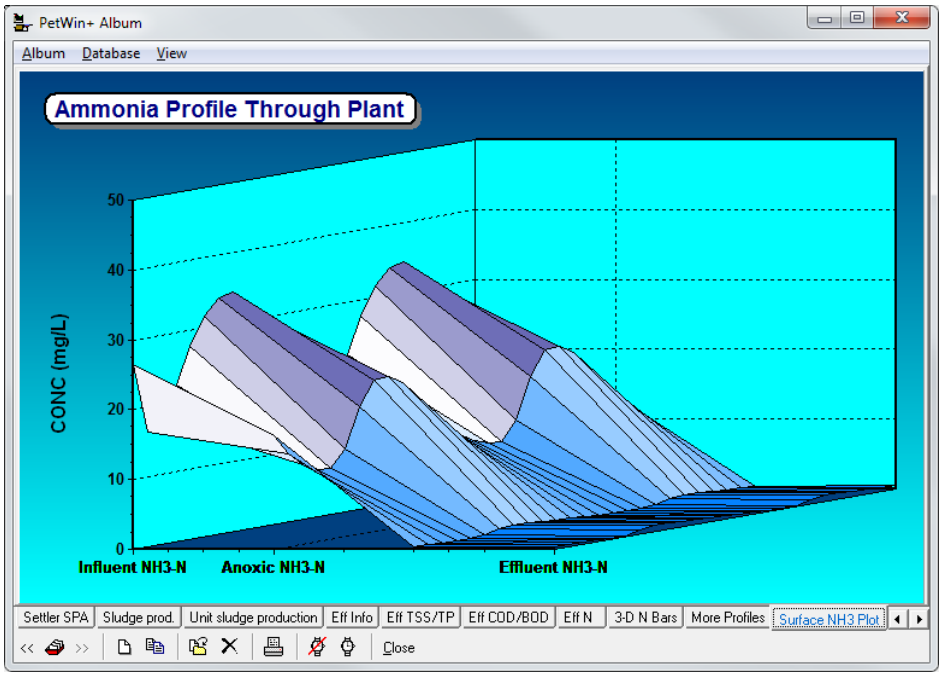
A bar chart



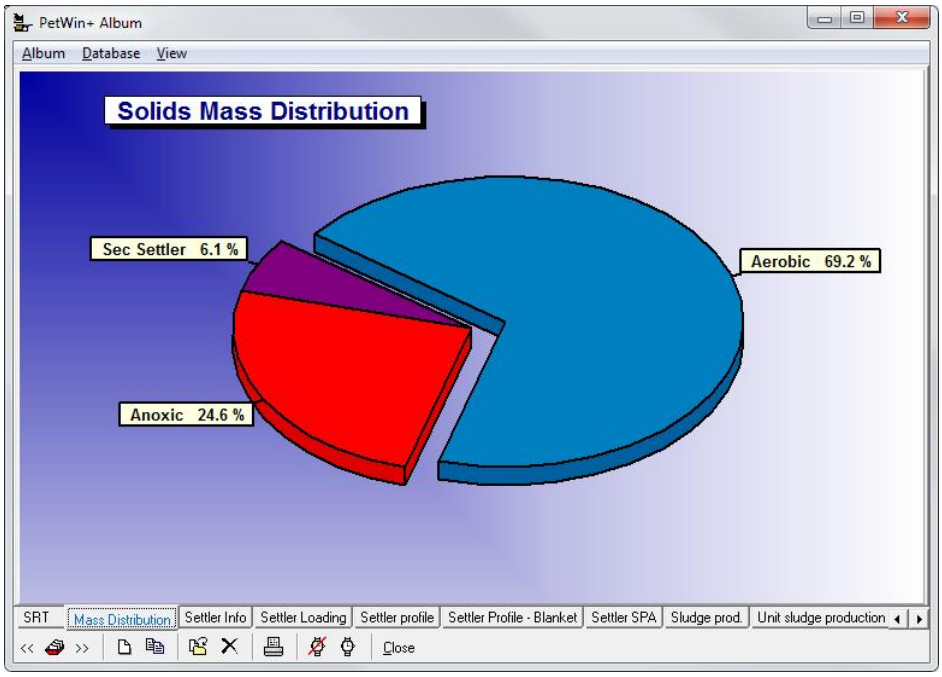
A three-dimensional line plot



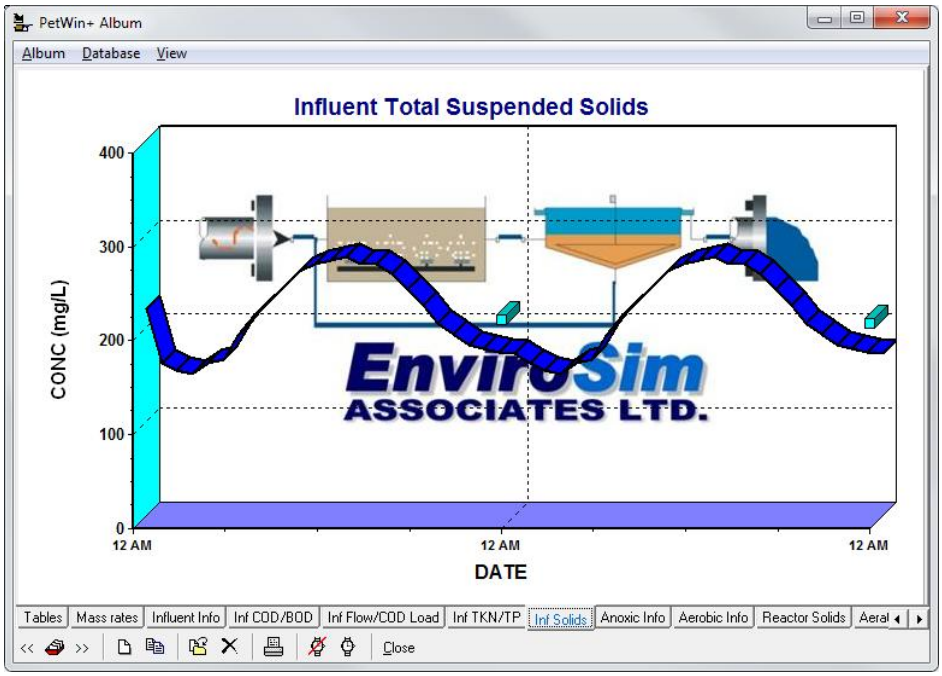
A two-dimensional point plot



A surface plot



A pie chart



Place pictures (or your company's logo!) in the chart background for presentations

Creating Reports

Note : For more information on **Creating Reports**, please see the Reports section of the **Data Output (charts, tables, reports)** chapter.

Customizing Reports

The type of information that appears in the report is completely customizable. The general information that can be included in a report may be:

- Project information (user name, plant name, project name, etc.);
- A picture of the project flowsheet;
- Global model parameter values;
- Global temperature setting;
- Album pages (charts, tables, etc.);
- The SRT for the system (if one is available);
- Any notes that have been entered in the PetWin+ Notes editor;

The reporting can be customized to include element-specific information on an element-type basis. Users can choose whether or not they want to include information for element types (e.g. Bioreactor) in the report. The type of information included in the report for each type of element can be different and may include:

- Physical data (volume, area, depth, # of diffusers, etc.);
- Operating data (average or flow-weighted average);
- Local settling parameters (if available);
- Local biological model parameters (if available);
- Aeration parameters (if available);

Printing Reports

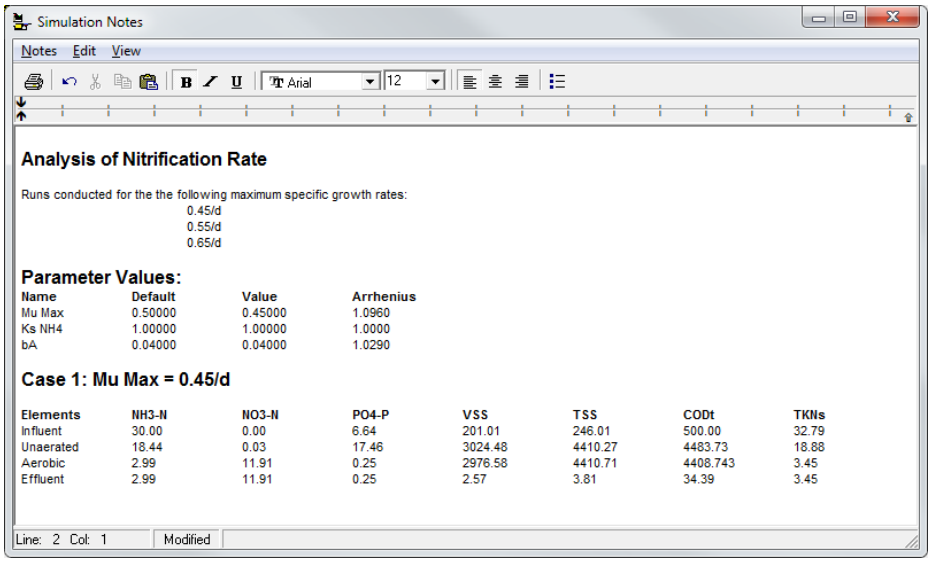
PetWin+ incorporates a powerful automatic report generation feature. With a single click, PetWin+ can generate a detailed printed report.

Generating Reports in Microsoft Word™

If you prefer an electronic version, PetWin+ also can generate your report as a Microsoft Word™ document. Like the printed report, the information contained in the electronic version is completely customizable and may include many different forms. Once PetWin+ has generated the document for you, you may use it as a basis for an engineering report, or cut and paste its contents into another document.

Related functionality includes the ability to print out all or ranges of the album pages. You can also set the number of album pages per printed page.

Additionally, PetWin+ has its own internal **Notes** editor (shown below) to help keep track of project details.



PetWin+'s internal simulation notes editor

Exporting Results to a Word Processor or Spreadsheet

It also is very easy to get results from PetWin+ into your word processor or spreadsheet. Charts, tables, system configuration layouts, etc. can be copied and pasted from PetWin+ to your reports. Tables can be exported as tabbed text and then quickly converted to tables, such as the one below which is a section of a Microsoft Word™ document.

Table 1

Elements	pH []	Volatile suspended solids [mgVSS/L]	Total suspended solids [mgTSS/L]	Total COD [mg/L]	Total Carbonaceous BOD [mg/L]	Total N [mgN/L]	Total P [mgP/L]
Influent	7.30	186.02	231.02	500.01	248.26	40.08	8.02
Anoxic	7.27	2265.64	3129.55	3411.66	1049.87	198.48	124.16
Aerobic	6.79	2219.00	3170.00	3321.44	998.59	197.95	124.16
Sec Settler	6.79	12.52	17.89	52.52	6.94	16.24	1.23
WAS	6.79	4363.75	6233.92	6498.89	1962.49	374.57	243.64
Effluent	6.79	12.52	17.89	52.52	6.94	16.24	1.23

A PetWin+ table exported to a word processing application

Customizing

There are a variety of features that can be customized in PetWin+. These are outlined briefly below.

Note : For more information on **Customizing**, please see the **Customizing PetWin+** section of the **General Operation** chapter.

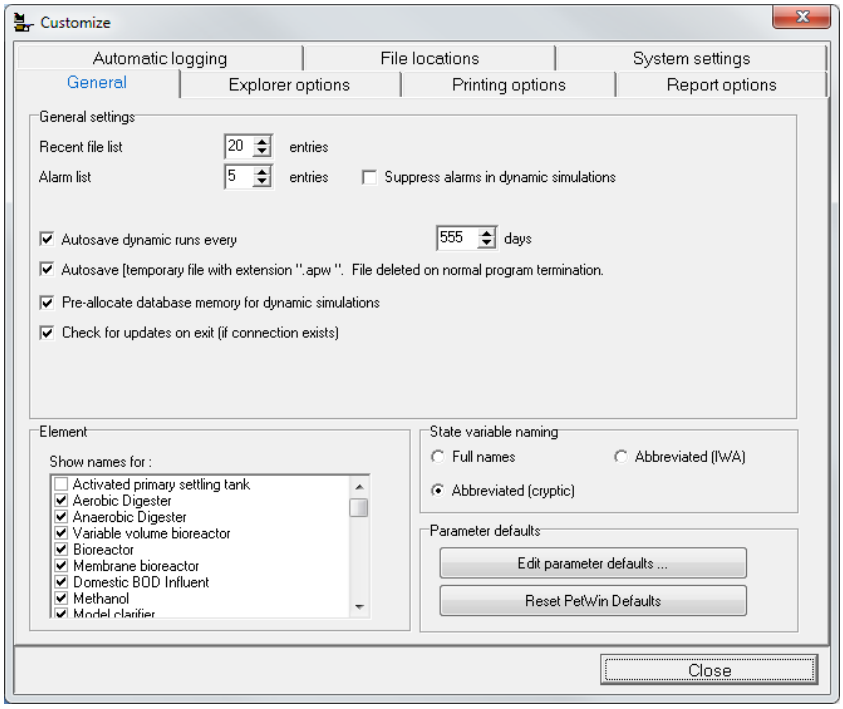
Customizing Environment Settings

PetWin+ offers users the ability to customize a number of environment settings to suit their needs. For example, some of the customizable features include:

- Printing options
- Report Options
- Automatic Logging
- File Locations

- Explorer Options
- System Settings

Access to the customizable features is managed through a central location, shown below.



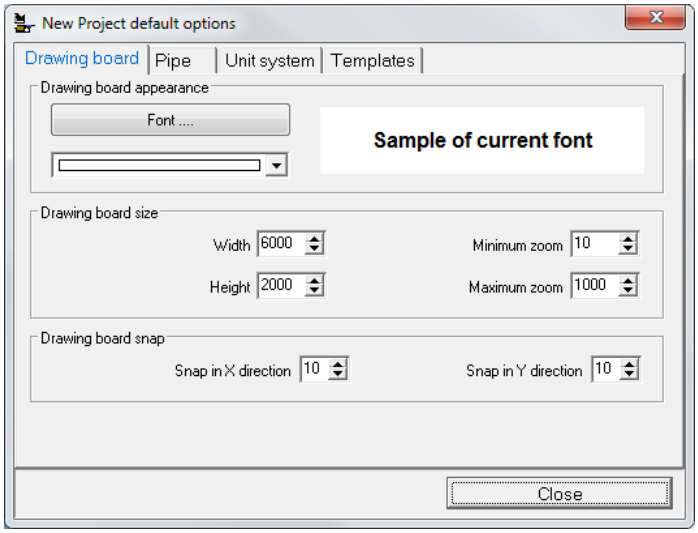
All customizable environment settings accessed through one dialog box

Customizing Project Settings

PetWin+ offers users the ability to customize a number of new project settings to suit their needs. For example, some of the customizable features include:

- Drawing board appearance
- Pipe Settings
- Unit System Settings
- Template Settings for the Album

Access to the customizable features is managed through a central location, shown below.



All customizable new project settings accessed through one dialog box

Customizing Charts

Finally, you can customize how PetWin+ generates new charts using the **Chart Master** and chart templates as shown below.

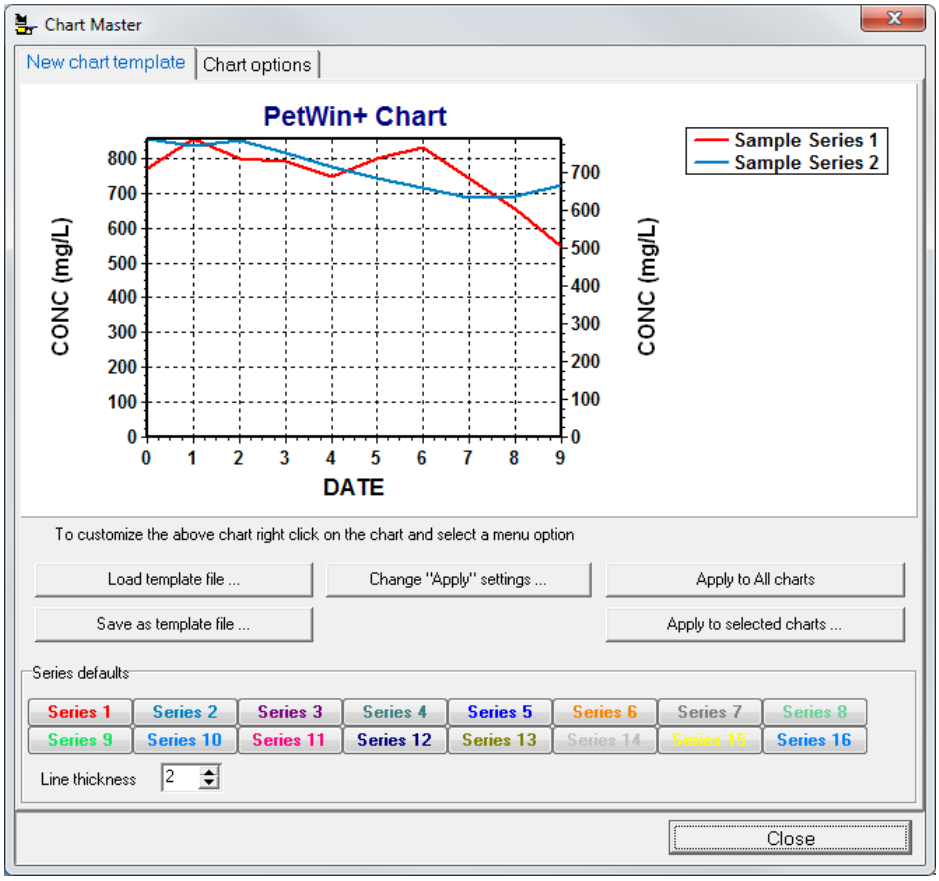


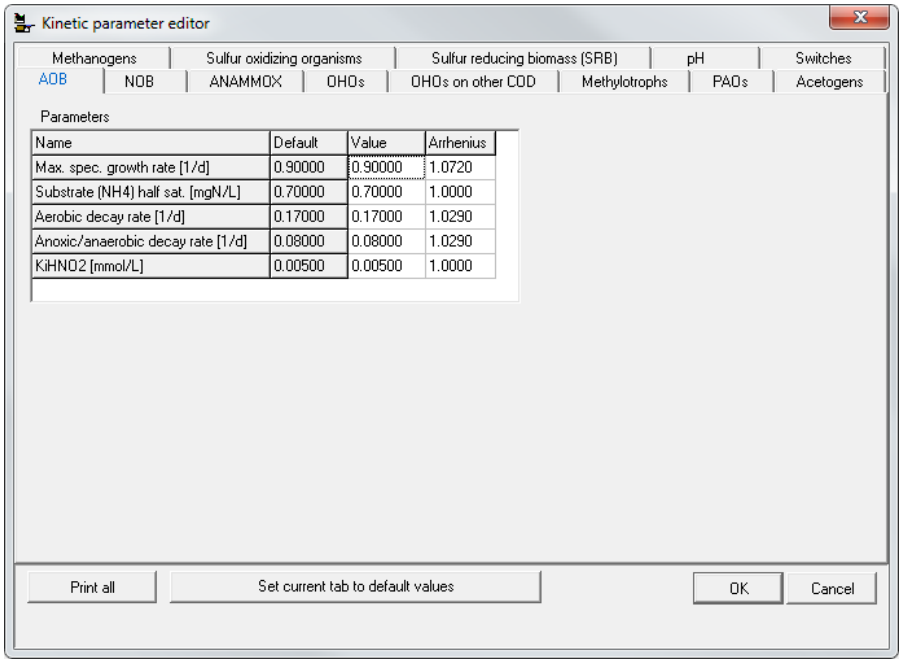
Chart Master

Model Information

PetWin+ is not only a slick simulator package. The user has ready access to detailed model features for the many operations. Model parameters may be accessed conveniently from **Model parameter editors** for different parts of the model, shown below is the editor for Kinetic parameters.

PetWin+ offers many utilities to facilitate process analysis. These include:

- Adjusting kinetic parameters and temperature in individual units;
- Simulation of biological activity in secondary clarifiers;
- Scheduling of many different operating parameters such as temperature, dissolved oxygen setpoint, air flow rate, and flow routing/splitting.



Model parameters may be changed through specific editors

Note : For more detail on **Model Information**, please see the Model Reference chapter.