Warning messages, what are they for?

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Introduction

The use of a software package is a two-way process: the user provides input to the program, and receives some form of output in response. This output can either be a set of results, or messages about the input information.

Where messages occur in WALLRUS

WALLRUS produces warning messages as part of the input and data preparation process. The aim of these messages is to provide helpful information to the user as the data is entered.

The software can also produce warning messages in the results files. These relate to particular aspects of the simulation, and give guidance to the user if the results show unusual features.

Types of message

WALLRUS can produce three different types of message.

i) Error message.

Error messages will halt the execution of the software. This type of message is also known as a fatal error and is normally encountered during the Hydrograph or Simulation programs when an invalid data item is found. The software will produce a small green box at the bottom of the screen, with the error message displayed in red. The same message will also be reproduced in the results file (.PRN). The only options available to the user are F6 (HELP) or F7 (QUIT).

ii) Warning message.

Warning messages will temporarily suspend the operation of the software. This type of message is used to draw attention to inconsistencies in the data that are not considered to be serious enough to halt the program completely. As with the error message the software will display the message in a green box at the bottom of the screen and in the results file (.PRN). The user can either press F5 to continue, F6 to ask for additional help and advice, or F7 to stop the program.

iii) Information message.

Information messages can occur at any time, but do not inhibit the operation of the software. Most commonly they appear on the screen at the data input stage, prompting you to check the range of a data item.

They can also appear while the software is running, and are used to provide information about the progress of the simulation. This can include details about files being used, the current simulation time, and any assumptions the software is making.

The output (.PRN) file can contain many information messages. They normally provide comments on hydraulic performance, the status of ancillary structures, and an overall summary of the hydraulic balance achieved within the sewer system.

What is the warning message saying ?

Any message, wherever produced, should be regarded as providing help, rather than hindrance. When producing a WALLRUS model, time scales are normally tight, and there is a tendency to ignore any warning messages that are produced.

If a warning message is produced, it is for a good reason. Most warning messages in WALLRUS are there to help the user avoid known problem areas, which in turn will save time.

Upper and lower limits for data items (such as pipe length) are included because the software can produce unstable results with data outside certain ranges. A lot of these limits are based on feedback from users who have encountered problems in the past, and are designed to stop new users meeting the same problems.

Sometimes it is not possible to enter data exactly as it appears in reality. Devices like inverted syphons and double-sided weirs have to be modelled using a combination of different data items and ancillary structures. Because of the unusual nature of such data warning messages may appear in the .PRN file. The results produced should be studied carefully to ensure they are stable and do not show generation of volume.

In the past Wallingford Software has been asked to down-grade error messages to simple warnings. This type of request would tend to indicate that some users do not want to know about potential errors or omissions in their models. Removing, or changing error messages might reduce the time taken to input the data, but any subsequent runs using such data would probably produce invalid results, which would be unrepresentative of the actual sewer system being modelled.

Common Warning messages

Listed below are some of the most common warning messages, together with the suggested action that should be taken if they occur.

Message	Action/ Reason
1) Head for pipe full discharge is above ground level.	Usually OK. Means that flooding will occur immediately after surcharge.
2) There is a step in invert levels at the downstream end of a pipe.	Usually means there is an error in the data. OK if at a tank or pumping station.
3) Pipe has a negative gradient.	Better to change it to a positive value. Can cause the pipe to stick in surcharge.
4) Pipe length too short.	Better to increase it to the recommended minimum value. May cause instabilities in the hydraulic calculations.
5) Generation of volume at a pumping station.	Incorrect delay time for one or more pumps. Also check the initial water level in the wet well.
6) Pipe size reduces downstream.	Usually means there is an error in the data. Will produce surcharge and backing up once pipe capacity is reached.
7) Pipe has a gradient less than 1:1000	Consider using free surface backwater option to estimate the storage in the pipe.
8) Insufficient DWF for backwater option.	Increase DWF to between 1% and 3% of pipe capacity. Backwater option requires a minimum flow to predict water depth correctly.
9) Generation of flow at an overflow structure.	Overflow orifice/pipe is in surcharge. Can be avoided by increasing overflow pipe size.
10) Cannot open file. Check file permissions.	Normally occurs on UNIX systems when the user does not have read/write permissions on a file. It can also occur on DOS systems if the computer has not been correctly configured.

Conclusions

Any message produced by the software must be regarded as help information, and should not be ignored. Take time to discover why the message is produced. Try to identify the source of the problem, and take corrective action as necessary.

You will produce a better, more accurate model if data errors and inconsistencies are removed in the early stages of model development.

Rachel Stagg, Ove Arup & Partners : Regarding warnings in the SIMPART 1 results file, what if the "real" data is actually unusual (eg stepped invert)?

Answer : The software is only flagging up possible "illogical" errors. Although it can deal with certain situations, there are others which it is not possible to model mathematically.

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Dave Walters, M Barber & Co : Can you please avoid using jargon in your warning messages.

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T Cooper, Northumbrian Water : Why is there a problem with tank plan areas < $2m^2$?

Answer : Mathematics. For ideal stability, areas must be at least equal to $2m^2$.