

RESROUTFL USERS GUIDE

Program Documentation

RESROUTFL uses the Easy Hydrograph Method (EHM) to determine the inflow hydrograph to the sump area. The EHM is derived from the Santa Barbara Urban Hydrograph Method (SBUHM). The reader is referred to "FINALLY! AN EASY HYDROGRAPH COMPUTATION METHOD" published by the South Florida Water Management District for a complete discussion on the hydrograph method.

The program RESROUTFL is a multiple mass balance program. The mass balance is performed on two storage areas. The first storage area is the sump at the outlet of the watershed. The program adds the outflow from the watershed to the sump storage volume and then subtracts the pump discharge to determine the sump elevation for the next time increment. The second storage area is the reservoir area. The program adds pump inflow and rainfall to the reservoir area and then subtracts the amount of water discharged through the outlet structure to determine the storage volume and elevation for the next time increment.

Two rainfall distributions are available in the RESROUTFL program. The first is the 72-hour rainfall distribution used by South Florida Water Management District. The second is the NRCS 24-hr, TYPE III, rainfall distribution.

The program RESROUTFL was written in the computer language BASIC to allow for a friendly user interface and was compiled using an AT&T Basic Compiler.

Hardware Requirements

RESROUTFL will run on an IBM PC or compatible machine with 256k of memory. A printer is required only if the user desires a hard copy of the results.

Installing the Program

This program can be obtained by contacting the State Conservation Engineer. Once obtained, the program should be run to install the program. The program will create a directory C:\ProgramFiles\usda\RESROUT\

Running RESROUTFL

The following gives some basic information in running the program. From Windows Explorer, change to the directory where the program file, RESROUT.exe, is located and click on the file to start the program. CCE machines should also be able to start the program by going to the start menu, then to Programs, then to Engineering Applications, and then to RESROUT and clicking on the icon.

Alternatively, from a DOS prompt, use the following directions:

1. Change directories to the directory containing the program RESROUT.
(C:\ProgramFiles\USDA\RESROUT\)
2. Type RESROUT and press RETURN.
3. The program will prompt for the needed inputs. The ENTER key must follow each entry.
4. When you have completed inputting all the data, the prompt will ask you to enter a file name to save input data. This allows the user to reuse the data again at a later time. The input data is stored in the same directory as the RESROUT program.
5. A copy of the output is saved in a file named "RUN#." On single runs the file name will always be RUN1 and will be stored in the same directory as the RESROUT program. This file will be overwritten when new data files are run.

It is recommended that the example file (royce) be examined and run before using this model.

Program Purpose and Description

The program RESROUTFL was written to assist landowners in south Florida in obtaining surface water drainage permits from the South Florida Water Management District. A typical system in which RESROUTFL would be used would have a watershed that drains by gravity into a sump area. The sump area would then be pumped into a reservoir where the water would discharge at a slow rate over a period of days.

The program is used to determine the maximum flood stage elevations in the reservoir and watershed area and to determine the length of time flooding occurs in the watershed area given the watershed area, rainfall, pump capacity, reservoir stage-storage relationship and reservoir outlet structure stage-discharge relationship.

The main feature of RESROUTFL that makes it unique is that the program allows up to 10 pumps discharging into the reservoir from the watershed area. Each pump is independently controlled by input water elevations of the watershed and reservoir as to when it turns on and off. If the number of pumps selected is zero, then the inflow hydrograph flows directly into the reservoir area and only the stage-discharge-storage relationship for the reservoir is necessary.

The following data is necessary to run the program: (1) pump data including discharge rates and pump on and off elevations; (2) time of concentration; (3) soil storage factor "S"; (4) acreage of reservoir; (5) acreage of watershed; (6) stage-storage-relationship of the watershed area; and (7) stage-storage-discharge-relationship for the reservoir. The critical flood elevation is the elevation at which damage to crops would occur if inundated.

The output increment is the time interval that output will appear in the print file. The smaller the output interval, the more voluminous the output.

The maximum length of run is a user specified length that will terminate program operation. To check for a 10-day drawdown elevation, the maximum length of run should be greater than 300 hours.

The program output contains a listing of all the input data including the stage-storage and/or discharge relationship, pump data and reservoir and watershed elevations and discharges for the output increment specified. The maximum discharges, elevations and runoff volumes are given after the routing. The amount of time the water level exceeded the critical flood elevation is also given.

The output is stored in a file named RUN#. The # corresponds to the run number on multiple runs. On single runs the file name will always be RUN1. The input data can be stored and reused in a user-specified file.